

FLIGHT GUIDE



**APPENDIX 2 OF THE
MISSION AIRCREW REFERENCE TEXT
REVISION 0 (DRAFT), SEPTEMBER 2002**



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MISSION FLOW CHART

- 1. Before leaving, check for:**
 - A. Proper uniforms and credentials (membership, 101/101T, CAP Motor Vehicle Operator and ROA cards; pilot and medical certificates, current CAPF 5 and 91)
 - B. Weight and Balance
 - C. Applicable current Sectional charts, Gridded charts, and Maps
 - D. Tie downs, chocks, survival gear, cleaning supplies, fuel tester
 - E. Money and equipment (e.g., flashlight, binoculars, imaging gear, and batteries)
 - F. Crew Duty Limitations (CAPR 60-1)
 - G. Weather, FAA Flight Plan and Flight Release (leave copy of Inbound CAPF 104 for FRO)
- 2. Secure Aircraft:**
 - A. Tie Down and Chock, then Parking Brake Off
 - B. Avionics Panel, Door and Baggage Door Locks; Pitot/Cowling Covers
 - C. Clean Windows and Leading Edges
 - D. Cancel Flight Plans (FAA and CAP)
 - E. Refuel and Pay Bill
- 3. Check in with Safety Officer:**
 - A. Complete Aircraft Safety Check (keep copy)
- 4. Check in with Administration:**
 - A. Sign in Aircrew
 - B. Sign in Aircraft and special equipment
- 5. Check in with Air Operations:**
 - A. Turn in Inbound CAPF 104
 - B. Turn in Keys
 - C. Get Sortie Information
- 6. Flight Planning:**
 - A. Flight Plan with Aircrew
 - B. Complete front of CAPF 104
 - C. General Briefing
- 7. Check in with Briefing Officer:**
 - A. Include entire aircrew, if space allows
 - B. Show completed CAPF 104 and obtain signature
 - C. Take Notes

MISSION FLOW CHART (CON'T)

8. **Check in with Air Operations:**
 - A. Obtain/discuss any changes
 - B. Air Operations Officer reviews and signs CAPF 104 (retain a copy)
9. **Start & Taxi:**
 - A. Show CAPF 104 to Flight Line Officer (final release)
 - B. Pre-flight the Aircraft
 - C. PIC briefs crew, assigns duties for each phase of flight
 - D. Follow Checklist for startup, lean engine, setup comm and nav aids
 - E. Set "Sterile Cockpit" and follow Taxi Procedures
10. **Fly Sortie:**
 - A. Maintain sterile cockpit until clear of congested airspace
 - B. Log (Time and Hobbs) and Call Mission Base with:
 - Takeoff Time
 - In / Out of Search Area(s)
 - Landing Time
 - C. Call "High Bird" at assigned times/conditions
11. **Return to Base and Landing:**
 - A. Follow checklists, assign duties for return phases of flight, sterile cockpit
 - B. Complete appropriate checks in step 2 and return keys to Air Operations
12. **Debrief:**
 - A. Fill in 'ATD' and 'Actual Landing Time' and complete CAPF 104
 - B. Check in with Debriefing Officer
13. **Next Mission:** complete steps 6 through 12
14. **Return Home:**
 - A. Turn in any issued equipment and settle bills (hotel and fuel; retain copies)
 - B. Complete Outbound CAPF 104
 - C. Check Weather and File FAA Flight Plan
 - D. Obtain CAP Flight Release (record phone number for later use)
 - E. Check Out with Air Operations
15. **Arriving Back Home:**
 - A. Complete step 2 and stow equipment
 - B. Call Mission Base with flight time (Hobbs)
 - C. Complete CAPF 108
 - D. Review lessons learned, and make sure crew gets home safely

OPERATIONAL RISK MANAGEMENT MATRIX

Hazard Identification	Low	Pt.	Moderate	Pt.	High *	Pt.	Controls
Man							
Pilot Experience/Training	≥1000 hrs PIC	0	≥250-1000 hrs PIC	2	≤250 hrs PIC	4	
Pilot Mission Time	≥1000 hrs msn	0	≥50-100 hrs msn	2	≤50 hrs msn time	3	
Observer	time ≥100 hrs msn	0	≥20-100 hrs msn	1	≤20 hrs msn time	3	
Scanner	time ≥20 hrs msn	0	≥10-20 hrs msn	1	≤5 hrs msn time	2	
Pilot Currency	≥10 hrs within last 30 days	0	≥5<10 hrs within last 30 days	2	<5 hrs within last 30 days	4	
Health/Crew Rest	Good health and proper crew rest	0	Fair health and/or signs of fatigue	2	Poor health and/or fatigued	N/G	
Machine							
Maintenance Factors Minimum Equipment List if applicable	Fully functional	0	Partially functional, MEL intact	1	Nonfunctional, MEL discrepancies	N/G	
Performance Factors	<5000' MSL search altitude	0	≥5000' <9000' MSL search altitude	1	≥9000' MSL search altitude	3	
Communications	Good comm, high bird available	0	Some blind spots no high bird	1	Poor comm. No high bird	3	
Mission							
Operations Tempo	1 search aircraft	0	2-4 search aircraft	1	>4 search aircraft	3	
Complexity	Simple tasks, no new technology	0	Complex tasks, no new technology	1	Complex tasks, new technology	3	
Environment							
Weather Additionally, check winds aloft	X-winds = calm Visibility = 7+ Ceiling = none Hazards = none	0	X-winds 5≤15 kts Visibility 3<7 Ceiling ≤1500' Icing = none Hazards = light turbulence	2 2 2 0 1	X-winds >15 kts Visibility <3 Ceiling = <500' Icing ≥ light Hazards = mod to severe turbulence	N/G	
Terrain	Low, flat	0	Foothills, featureless	2	High, mountainous	4	
Search Altitude	>2000'AGL		≤2000'≥1000'AGL	1	<1000'AGL	3	
Night Operations	VFR w/Current Instrument Rating	5	VFR w/out Instrument Rating	10	IMC	15	
Airfield	Familiar	0	Unfamiliar	2			
Additional Entries							
TOTALS:							
Overall Risk Assessment					Initials (if required)		Date/Time
Low Risk = 0 – 30 Flight Release Officer Approval							
Moderate Risk = 31 -34 Squadron DO/CC Approval required							
High Risk = 35 or greater IC/Wing DO Approval required							
NO GO (N/G)							

* Implement suitable controls for any item in the High range

For moderate and high risk missions, notify the approval authority of the risk level, the threats driving the risk, and the control measures being used to mitigate the threat. The key to implementing ORM is identifying the threat and incorporating a control method to limit the impact of the threat. Common methods of threat reduction listed with some typical responses:

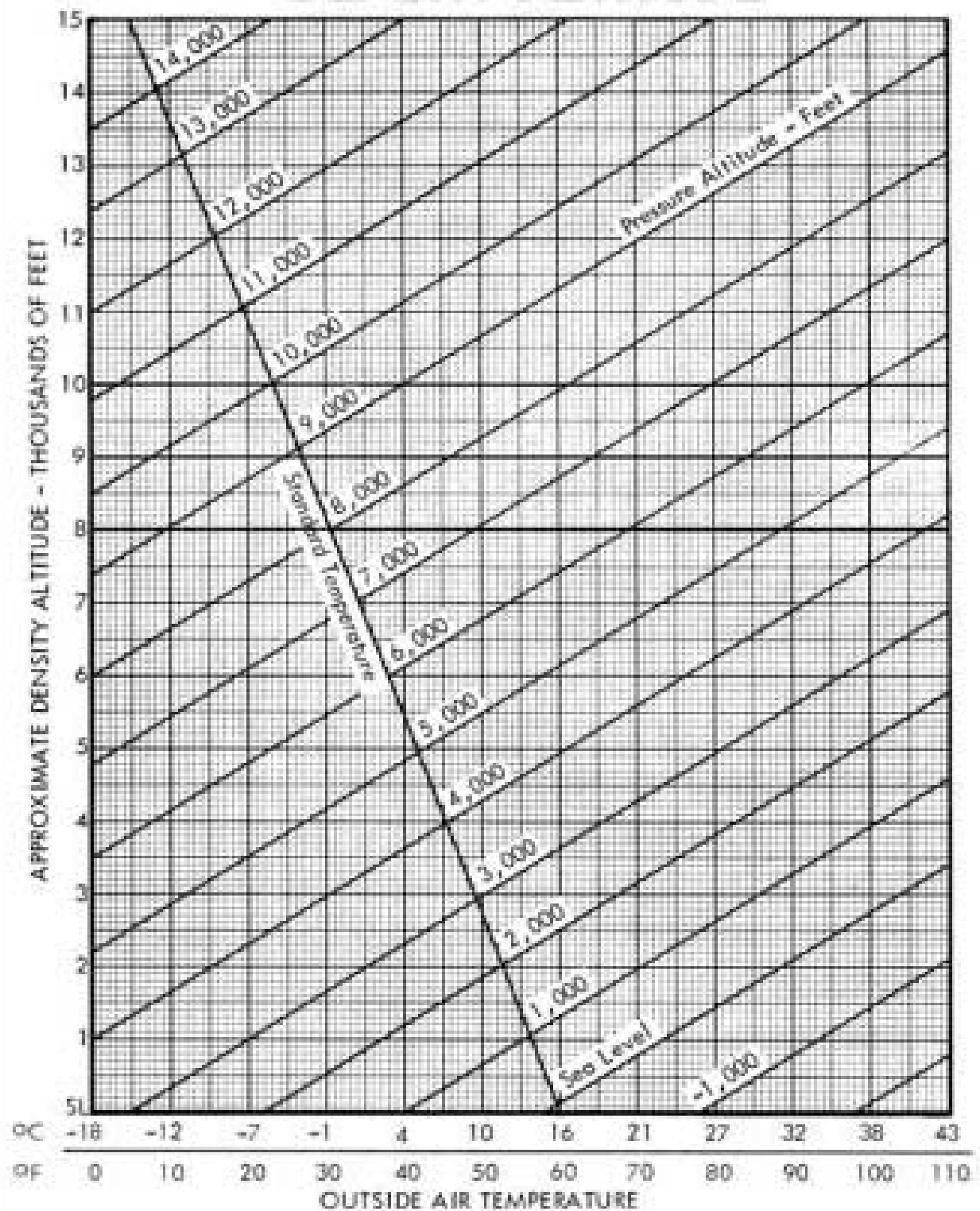
Limit Crew Duty Day – “We will be on the ground by 0300 hours...”

Change crew makeup – “I’m not flying today” or “We need a more experienced or better-rested crew member...”

Change mission profile – “We will wait until sunup or until weather conditions improve before we launch.”

Identify controls for specific threats – “Its at night and we have high terrain, so the minimum altitude we will operate at is 5200’...”

DENSITY ALTITUDE



CROSSWIND DATA SHEET

15 KNOT CROSSWIND COMPONENT IS THE MAXIMUM INDICATED	WIND SPEED (Kts)	DEGREES OFF RUNWAY HEADING								
		10	20	30	40	50	60	70	80	90
NOTE: <i>The maximum demonstrated crosswind component for a Cessna 172 is 15 knots. CAP Regulation 60-1 limits CAP aircraft to the maximum demonstrated crosswind velocity.</i>	8	1	3	4	5	6	7	8	8	8
	9	2	3	4	6	7	8	8	9	9
	10	2	3	5	6	8	9	9	10	10
	11	2	4	5	7	8	10	10	11	11
	12	2	4	6	8	9	10	11	12	12
	13	2	4	6	8	10	11	12	13	13
	14	2	5	7	9	11	12	13	14	14
	15	3	5	7	10	11	13	14	15	15
	16	3	5	8	10	12	14	15		
	17	3	6	8	11	13	15			
	18	3	6	9	12	14				
	19	3	6	9	12	15				
	20	3	7	10	13	15				
	21	4	7	10	13					
	22	4	8	11	14					
	23	4	8	11	15					
	24	4	8	12	15					
	25	4	9	12						
	26	5	9	13						

WEIGHT AND BALANCE WORK SHEET

		WEIGHT	× ARM	= MOMENT
Basic Empty Weight (current)				
Front Seats				
Rear Seats				
Baggage Area 1 (C-172 max 120#) *				
Baggage Area 2 (C-172 max 50#) *				
Fuel:	Gallons × 6 pounds/gal.			
TOTALS			CG	

Directions: *Multiply each WEIGHT by the ARM to get a MOMENT (A calculator is recommended). The ARM for each station can be found in your Pilot's Operating Handbook (POH). Add all the weights and moments to get TOTALS. Divide the TOTAL MOMENT by the TOTAL WEIGHT to find an ARM--this is your center of gravity (CG). Ensure your CG is within the published range from your POH. Ensure you do not exceed the maximum gross weight as published in your POH.*

- * Combined Total of baggage areas may not exceed 120#
Remember to include permanently stowed items (e.g., survival kit and chocks)

FAA FLIGHT PLAN

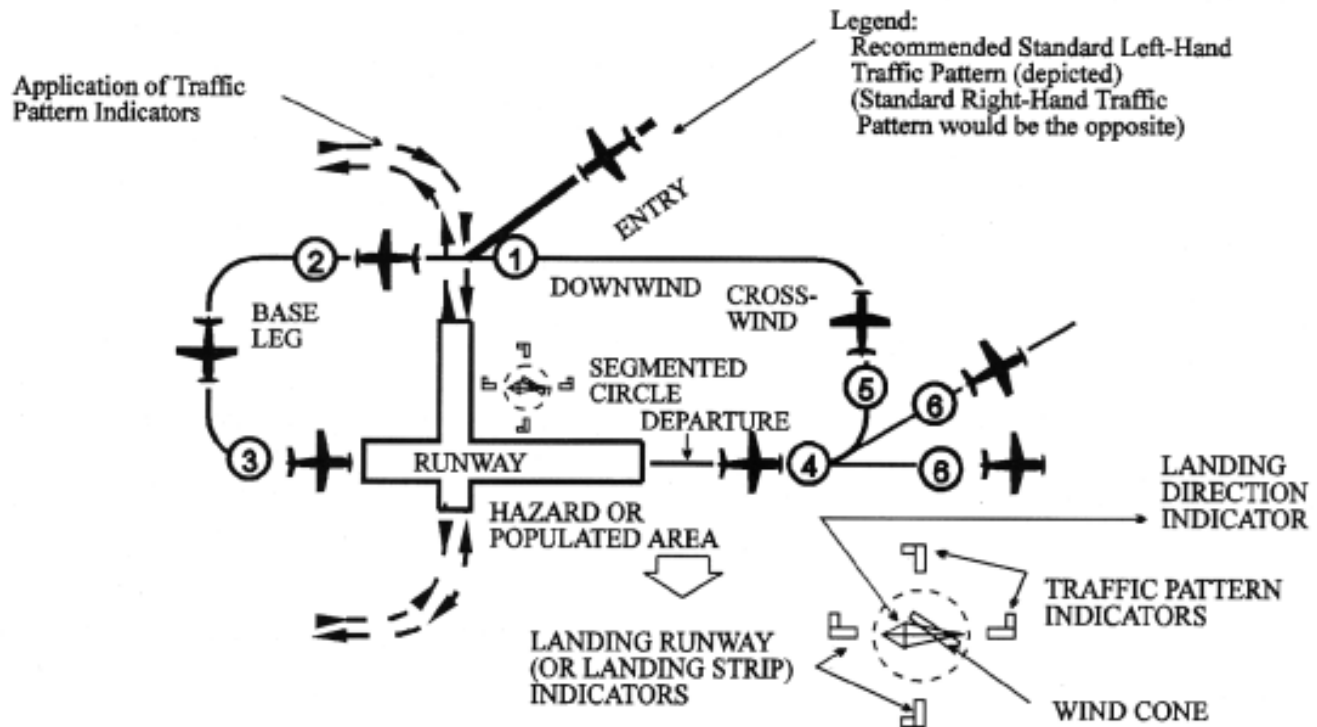
Form Approved OMB NO. 2120-0026

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION FLIGHT PLAN		(FAA USE ONLY) <input type="checkbox"/> PILOT <input type="checkbox"/> VNR <input type="checkbox"/> STOPOVER			TIME STARTED		SPECIALIST INITIALS		
1. TYPE		2. AIRCRAFT IDENTIFICATION		3. AIRCRAFT TYPE/SPECIAL EQUIPMENT		4. TRUE AIRSPEED		5. DEPARTURE POINT	
VFR		CPF 4239				KTS			
IFR									
DVFR									
6. DEPARTURE TIME									
PROPOSED (Z)					ACTUAL (Z)				
7. CRUISING ALTITUDE									
8. ROUTE OF FLIGHT									
9. DESTINATION (Name of airport and city)									
10. EST. TIME ENROUTE									
HOURS					MINUTES				
11. REMARKS N99545, CAP Flight 4239									
12. FUEL ON BOARD		13. ALTERNATE AIRPORT(S)		14. PILOT'S NAME, ADDRESS & TELEPHONE NUMBER & AIRCRAFT HOME BASE				15. NUMBER ABOARD	
HOURS		MINUTES							
				17. DESTINATION CONTACT/TELEPHONE (OPTIONAL)					
16. COLOR OF AIRCRAFT		CIVIL AIRCRAFT PILOTS. FAR Part 91 requires you file an IFR flight plan to operate under instrument flight rules in controlled airspace. Failure to file could result in a civil penalty not to exceed \$1,000 for each violation (Section 901 of the Federal Aviation Act of 1958, as amended). Filing of a VFR flight plan is recommended as a good operating practice. See also Part 99 for requirements concerning DVFR flight plans.							

FAA Form 7233-1 (8-82)

CLOSE VFR FLIGHT PLAN WITH _____ FSS ON ARRIVAL

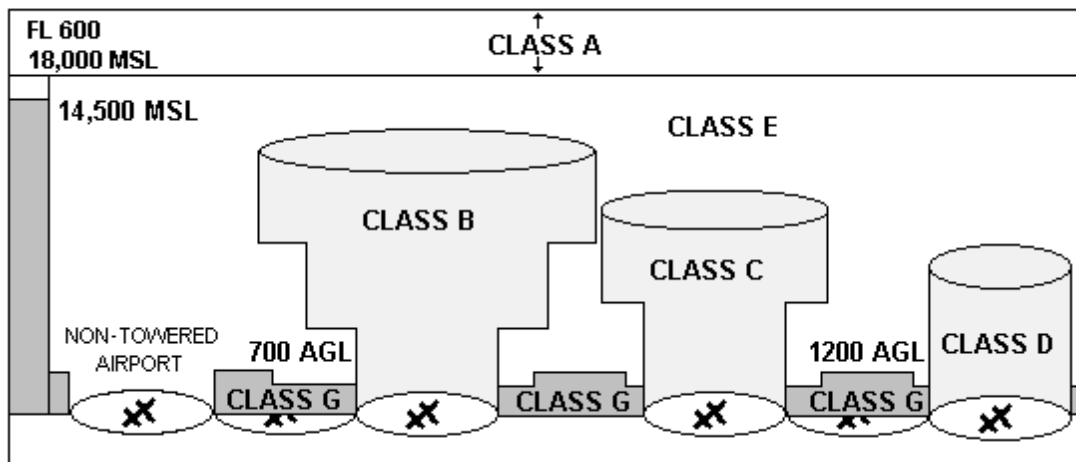
BASIC VFR TRAFFIC PATTERN UNCONTROLLED FIELD



As you fly the pattern note potential emergency landing areas off the ends of each runway, for use in "engine failure on takeoff" procedures.

VFR FLIGHT INFORMATION

VFR AIRSPACE CLASSIFICATIONS



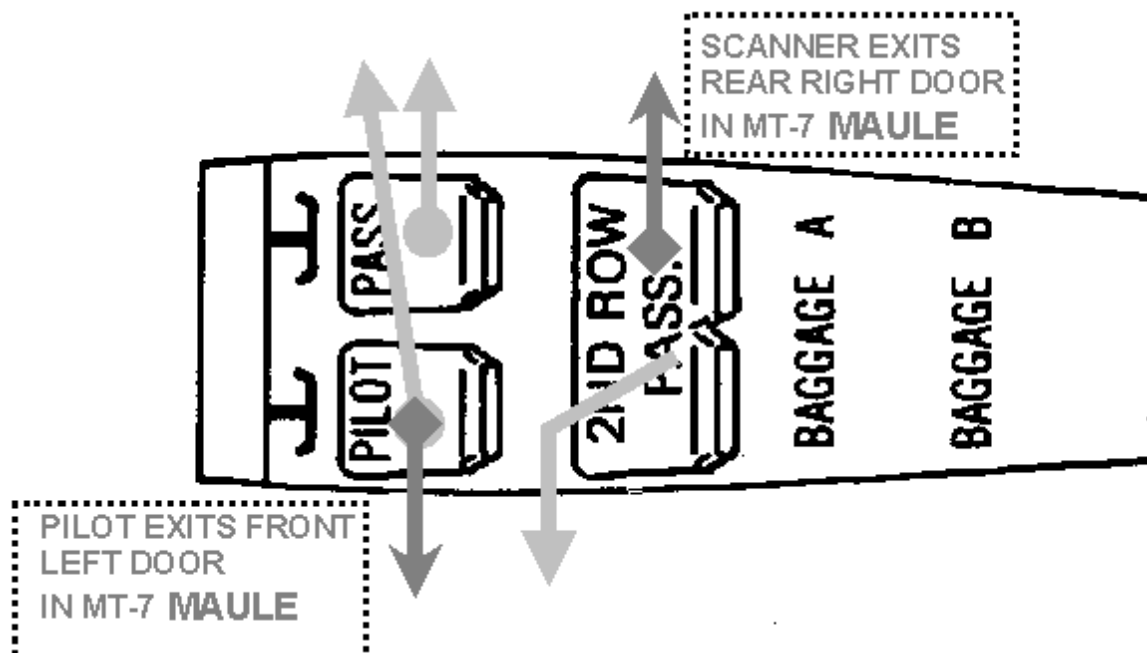
BASIC VFR WEATHER MINIMUMS

AIRSPACE	FLIGHT VISIBILITY	DIST. FROM CLOUDS
CLASS A	NOT APPLICABLE	NOT APPLICABLE
CLASS B	3 STATUTE MILES	CLEAR OF CLOUDS
CLASS C	3 STATUTE MILES	500 FT BELOW 1,000 ABOVE 2,000 HORIZONTAL
CLASS D		500 FT BELOW 1,000 ABOVE 2,000 HORIZONTAL
CLASS E LESS THAN 10,000 FEET MSL	3 STATUTE MILES	500 FT BELOW 1,000 ABOVE 2,000 HORIZONTAL
AT OR ABOVE 10,000 FEET MSL	5 STATUTE MILES	1,000 FT BELOW 1,000 ABOVE 1 NM HORIZONTAL
CLASS G (1,200 FEET ABOVE THE SURFACE (REGARDLESS OF MSL))		
DAY, EXCEPT AS PROVIDED IN SECTION 91.155 (B)	1 STATUTE MILE	CLEAR OF CLOUDS
NIGHT, EXCEPT AS PROVIDED IN SECTION 91.155 (B)		500 FT BELOW 1,000 ABOVE 2,000 HORIZONTAL
MORE THAN 1,200 FEET ABOVE THE SURFACE BUT LESS THAN 10,000 FT MSL		
DAY	1 STATUTE MILE	500 FT BELOW 1,000 ABOVE 2,000 HORIZONTAL
NIGHT	3 STATUTE MILES	500 FT BELOW 1,000 ABOVE 2,000 HORIZONTAL
MORE THAN 1,200 FEET ABOVE THE SURFACE & AT OR ABOVE 10,000 FT MSL	5 STATUTE MILES	1,000 FT BELOW 1,000 ABOVE 1 NM HORIZONTAL

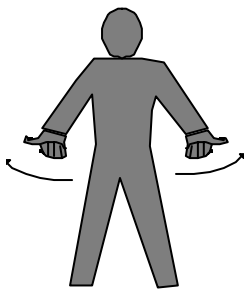
EMERGENCY EGRESS

WARNING! DURING OVERWATER EGRESS, *DO NOT* DEPLOY PERSONAL FLOTATION DEVICES UNTIL CLEAR OF AIRCRAFT.

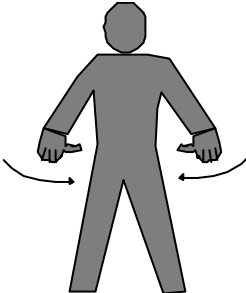
- **PILOT** ADJUSTS SEAT ALL THE WAY FORWARD
- **OBSERVER** ADJUSTS SEAT ALL THE WAY TO THE REAR
- **SCANNER** SECURES SURVIVAL EQUIPMENT/RAFT FROM BAGGAGE COMPARTMENT
- **PILOT** AND **OBSERVER** EXIT THROUGH RIGHT DOOR (**PILOT** EXITS FRONT LEFT DOOR IN MT-7 MAULE)
- **SCANNER** EXITS THROUGH LEFT DOOR (REAR RIGHT DOOR IN MT-7 MAULE) <<DEPLOYS RAFT IF OVERWATER>>
- **CREW** MEETS 50 FEET BEHIND THE AIRCRAFT (ON RAFT IF OVERWATER) <<REMAIN UPWIND OF ANY SMOKE>>



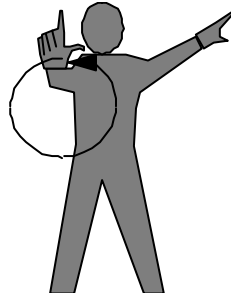
FLIGHTLINE HAND SIGNALS



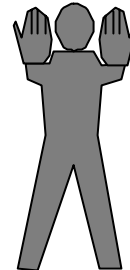
Outward motion with Thumbs -
PULL CHOCKS



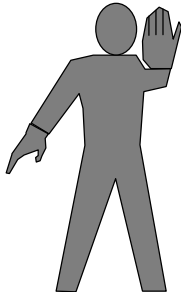
Inward motion with thumbs -
INSERT CHOCKS



Circle with hand -
START ENGINE



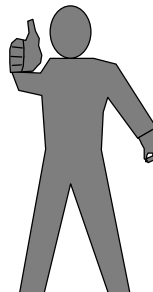
Hands out making a pulling motion -
COME AHEAD



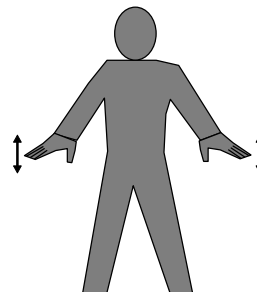
Motion forward, pointing left -
TURN LEFT



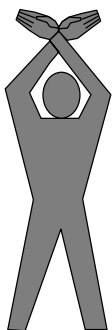
Motion forward, pointing right -
TURN RIGHT



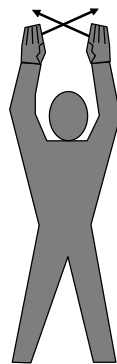
Thumbs up -
ALL CLEAR - O.K.



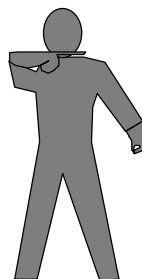
Downward motion with palms -
SLOW DOWN



Hands crossed above head -
STOP



Crossing hands over head -
EMERGENCY STOP



Slash throat with finger -
CUT ENGINE

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Pilot Guide to Airport Signs and Markings

Help Prevent
Runway Incursions

"READ BACK"
Your Air Traffic
Clearance!

Airport Markings



HOLDING POSITION:

Hold Short of Intersecting Rwy
Also Land and Hold Short Marking



ILS CRITICAL AREA:

Hold Short During IMC
Conditions



TAXIWAY/TAXIWAY HOLDING POSITION:

Hold Short of
Intersecting Taxiway When
Directed by ATC



MOVEMENT AREA BOUNDARY:

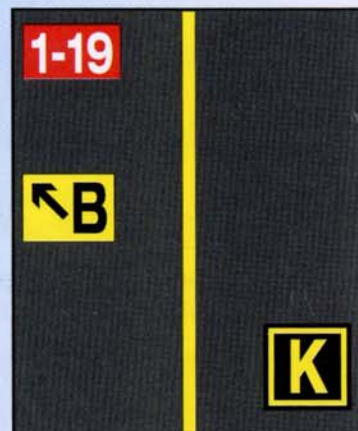
Defines Boundary of Movement
Area and Non-Movement Area



TAXIWAY EDGE: Defines Edge of Usable Full Strength
Taxiway Pavement. Adjoining Pavement NOT Usable



DASHED TAXIWAY EDGE: Defines Edge Taxiway
Where Adjoining Pavement or Apron IS Available for Taxi



SURFACE PAINTED HOLDING POSITION:

Hold Short of
Intersecting Runway on Twy

SURFACE PAINTED TAXIWAY DIRECTION:

Direction &
Designation of Intersecting Twy

SURFACE PAINTED TAXIWAY LOCATION:

Identifies Twy
on Which Aircraft is Located

Pilot Guide to Airport Signs and Markings

Airport Signs — Action or Purpose

4-22

TWY/RWY HOLD POSITION:
Hold Short of Runway on
Taxiway

Also . . .

RWY/RWY HOLD POSITION:
Hold Short of Intersecting
Runway

8-APCH

RWY APCH HOLD POSITION:
Hold Short for Acft on
Approach

ILS

ILS HOLD POSITION:
Hold Short of ILS Critical
Area



NO ENTRY: Identifies Paved
Areas Where Aircraft Entry
is Prohibited



TAXIWAY LOCATION:
Identifies Taxiway on Which
Aircraft is Located



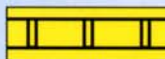
RUNWAY LOCATION:
Identifies Runway on Which
Aircraft is Located



**RUNWAY DISTANCE
REMAINING:** Identifies
Runway Length Remaining



RUNWAY BOUNDARY:
Exit Boundary of Rwy
Protected Areas



**ILS CRITICAL AREA
BOUNDARY:** Exit Boundary
of ILS Critical Area



RUNWAY EXIT: Defines
Direction & Designation of
Exit Twy from Rwy

Also . . .

TWY DIRECTION: Defines
Direction & Designation of
Intersecting Taxiway(s)



OUTBOUND DESTINATION:
Defines Directions to
Take-Off Runways



INBOUND DESTINATION:
Defines Directions for
Arriving Aircraft



TAXIWAY ENDING MARKER:
Indicates Twy Does Not
Continue



DIRECTION SIGN ARRAY:
Identifies Location in
Conjunction with Multiple
Intersecting Taxiways

If in
Doubt
Ask!

ATCT Light Gun Signals

Color and Type of Signal

Aircraft on the Ground

STEADY GREEN

**Cleared for
Takeoff**

FLASHING GREEN

Cleared to Taxi

STEADY RED

STOP

FLASHING RED

**Taxi Clear of the
Runway in Use**

FLASHING WHITE

**Return to Starting
Point on Airport**

ALTERNATING RED/GREEN

**Exercise Extreme
Caution**

Elevated
Guard Lights
Hold Short



In-Pavement
Guard Lights
Hold Short

(CONTINUED ON REVERSE SIDE)

SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM (SMGCS; PRONOUNCED "SMIGS")

Enhance taxiing capabilities in low visibility conditions and reduce the potential for runway incursions.

Stop Bar Lights are a row of red unidirectional in-pavement lights installed along the holding position marking. Operate in conjunction with green centerline lead-on lights:

- ATC gives clearance to enter the runway. Stop bar lights extinguish and the green lead-on lights illuminate.
- Do not cross illuminated stop bar lights, even if given permission by ATC!

Runway Guard Lights are a set of alternately flashing yellow lights, either elevated or in-pavement. Positioned at all taxiways that provide access to an active runway.

- Denote presence of an active runway and identify the location of a runway holding position marking.

Clearance Bar Lights are yellow in-pavement lights used to denote holding positions for aircraft (and vehicles).

- When used for hold points, they are co-located with geographic position markings.

Taxi Centerline Lighting consists of green in-pavement lights.

- Used to guide traffic in low visibility or darkness.

Geographic Position Markings are "pink spots" outlined with a black and white circle and designated with a number, a letter, or both.

- Can be used as hold points or for position reporting.

PMA7000MS AUDIO PANEL



NOTE: COORDINATE RADIO AND INSTRUMENT OPERATION WITH PIC BEFORE FLIGHT

VOLUME-**PUSH ON/OFF** (CHECK FOR AT LEAST 1 LED, UNLESS IN COM3 MODE)

HIGH/LOW/TEST SWITCH-**TEST** (CHECK FOR ILLUMINATION OF **O** **M** **I** INDICATORS) **ADJUST SENSITIVITY IF AUDIO IN USE**

ISO/ALL/CREW TOGGLE SW – **SET AS REQUIRED** (INTERCOM MODE)

INTERCOM MODES				
MODE	PILOT HEARS	OBSERVER HEARS	SCANNER HEARS	COMMENTS
ISO	A/C RADIOS PILOT SIDETONE	OBSERVER & SCANNER INTERCOM	OBSERVER & SCANNER INTERCOM	ISOLATES PILOT
ALL	PILOT OBSERVER SCANNER A/C RADIO	OBSERVER PILOT SCANNER A/C RADIO	SCANNER PILOT OBSERVER A/C RADIO	ALL HEAR RADIOS AND CAN COMMUNICATE ON THE INTERCOM
CREW	PILOT OBSERVER A/C RADIO	OBSERVER PILOT A/C RADIO	SCANNER(S)	ISOLATES SCANNER(S)

COM SWAP SW- **SWAP PILOT AND OBSERVER RADIOS** LOCATED ON INSTRUMENT PANEL (SWAP INDICATOR ILLUMINATES)

AUDIO SELECTOR SWITCHES-**SET AS REQUIRED** (SEE BELOW)

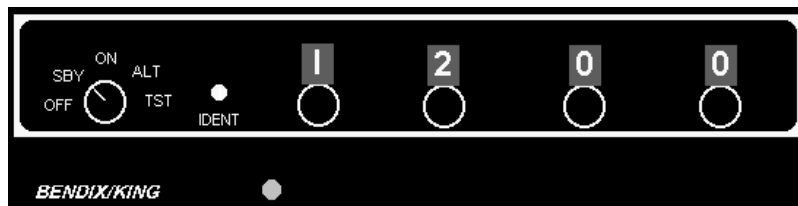
COM1- VHF1

COM2-VHF2

NAV1-VOR1 RADIO

NAV2-VOR2 RADIO

PMA7000MS AUDIO PANEL (CONT'D)



MR-MARKER BEACON

ICS-ACTIVATES INTERCOM IN SPLIT MODES

ADF-ADF RADIO (MAY NOT BE AVAILABLE IN ALL AIRCRAFT)

COM3-CAP RADIO

DME-DISTANCE MEASURING EQUIPMENT (DME)

SPR-CABIN SPEAKER (NOT INSTALLED ON ALL CAP AIRCRAFT)

TRANSMITTER COMBINATIONS

	NORMAL		SWAP	
MIC SELECT	PILOT	OBSERVER	PILOT	OBSERVER
Com 1	Com 1	Com 1	Com 2	Com 2
Com 2	Com 2	Com 2	Com 1	Com 1
Com 3	Com 3	Com 3	No Swap	No Swap
Com 1/2 *	Com 1	Com 2	Com 2	Com 1
Com 1/3 *	Com 1	Com 3	Com 3	Com 1
Com 2/3 *	Com 2	Com 3	Com 3	Com 2

*SPLIT MODES MAY RESULT IN AUDIO 'BLEED OVER' BETWEEN FREQUENCIES

**SPLIT
MODES**



MISSION SETTING –Com 1/3

NOTE: ENSURE TRANSMITTER SETTING IS AS REQUIRED BEFORE USING RADIO.

TRANSMIT INDICATOR-ILLUMINATES WHEN TRANSMITTING ON RADIO

SWAP-ILLUMINATES WHEN SWAP SWITCH IS ACTIVATED

NAT NPX-138 VHF FM RADIO



WARNING! *DO NOT OPERATE DURING IFR FLIGHT*

NOTE: VHF TRANSMISSIONS ON CAP FREQUENCIES MAY INTERFERE WITH SLOW- SCAN DOWNLINK

✓POWER -UP

MN KNOB – ON (SELF TEST)

NEXT SW - TOGGLE LEFT/RIGHT

EDIT SW - CENTERED

DISP - ID MODE (DISPLAYS CH NUMBER & TEST LABEL)

SCAN/NORM/GD - SWITCH TO NORM

GD1/GD2 SW - GD2 (LESS TRAFFIC)

CHAN SELECT - AS REQUIRED

MN KNOB - ADJUST VOLUME

SQ/HELP - PRESS TO CHECK SQUELCH

GD - MINIMUM

✓GUARD CHANNEL OPERATION

SCAN/NORM/GD - **GD**

GD1 - 148.150 (DEFAULT SETTING)

GD2 - 149.5375 (DEFAULT SETTING)

GD - MINIMUM

MN - MINIMUM

TDFM-136 DIGITAL/ANALOG VHF FM RADIO



✓NORMAL OPERATION

OFF/MAIN - MAIN (now controls transmit / receive volume)

GUARD - Volume adjust (receive only)

SQUELCH - Pushbutton (DO NOT OPERATE)

MN/GD - GD (Guard)

G1/G2 - G1 - 149.5375 (Air-to-Ground)
[G2 is 148.150 (Primary)]

HI/LO - HI (10 watts; LO is 1 watt)

4 - Back (Scroll memory down; wraps around)

6 - Forward (Scroll memory up; wraps around)

2 - Display brighter

8 - Display dimmer

5 - Scan (Scan lists, if enabled, set by comm officer)

If receive a message over Guard, take MN/GD toggle to GD, reply, and then back to MN to continue using the main frequency.

CAP NATIONAL STANDARD CHANNELIZATION PLAN

CHANNEL	Frequency	TYPE	Tone	Code	Use
Channel 1	148.1500 MHz	Simplex	100 Hz	1Z	Primary Simplex
Channel 2	148.1250 MHz	Simplex	100 Hz	1Z	Secondary Simplex
Channel 3	148.1375 MHz	Simplex	100 Hz	1Z	Ground Tactical
Channel 4	149.5375 MHz	Simplex	100 Hz	1Z	Air-to-Ground / Air

IMPORTANT GENERAL FREQUENCIES

Actual SAR Aviation Band 123.1 MHz
Practice SAR Aviation Band 122.9 MHz
In-flight Weather (Flight Watch) 122.0 MHz
General Flight Service 122.2 MHz

HELPFUL & IMPORTANT TELEPHONE NUMBERS

Weather Briefing (Local Flight Service Station) 1-800-WX-BRIEF
NATIONAL CAP HQ ES/CD/DDR: (334) 953-4220
CAP Operations Fax Back: (334) 953-2599
AFRCC Missions Only: (800) 851-3051
AFRCC Admin: (804) 764-8117
Time Hack: (202) 762-1401, (303) 499-7111, DSN 762-1401

CAP FM RADIO REPORTS

- Radio check (initial flight of the day)
- Take off time ("wheels up") *
- Time entering a search area *
- Time exiting a search area *
- Landing time ("wheels down") *
- Ops Normal (at intervals briefed by mission staff)

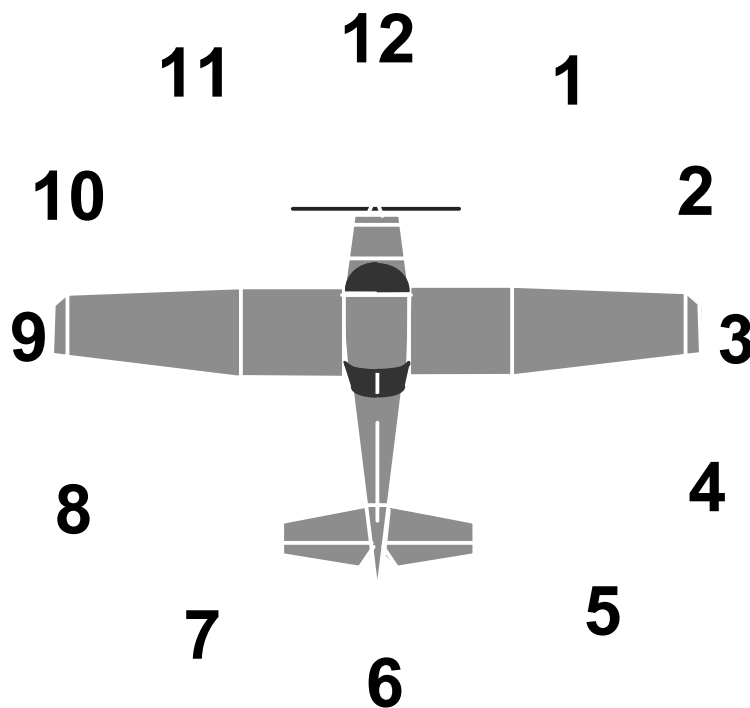
* Log the Time and Hobbs when making these reports to ensure you have all the data needed to complete the CAPF 104

PROWORDS

TERM	DEFINITION or MEANING
AFFIRMATIVE	Yes.
ALL AFTER	The portion of the message that follows (word).
ALL BEFORE	The portion of the message that precedes (word).
BREAK	I hereby indicate the separation of the text from other portions of the message.
COPY	I understand.
CORRECT	You are correct, or what you have transmitted is correct
CORRECTION	An error has been made in this transmission. Transmission will continue with the last word correctly transmitted.
DISREGARD	The last transmission was in error. Disregard it.
DISREGARD THIS TRANSMISSION	This transmission is in error. Disregard it. This proword should not be used to cancel any message that has been completely transmitted and for which receipt or acknowledgment has been received.
EXEMPT	The addresses immediately following are exempted from the collective call.
FIGURE(s)	Numerals or numbers follow.
FROM	The originator of this message is the address designator that follows.
I READ BACK	The following is my response to your instructions to read back.
I SAY AGAIN	I am repeating transmission or portion indicated.
I SPELL	I shall spell the next word phonetically.
I VERIFY	That which follows has been verified at your request and is repeated. To be used only as a reply to VERIFY.
INFO	The addressees immediately following are addresses for information.
INITIALS	Personal initials shall be spoken phonetically prefixed by the word "INITIALS."
MESSAGE FOLLOWS	A message that requires recording is about to follow. Transmitted immediately after the call. (This proword is not used on nets primarily employed for conveying messages. It is intended for use when messages are passed on tactical or reporting nets.)
MORE TO FOLLOW	Transmitting station has additional traffic for the receiving station.
NEGATIVE	No or "permission not granted" or "that is not correct."
OUT	This is the end of my transmission to you and no answer is required or expected.
OVER	This is the end of my transmission to you and a response is necessary. Go ahead; transmit.
PRIORITY	Precedence PRIORITY.
READ BACK	Repeat my message back to me. A request to repeat instructions back to the sender, for the purpose of confirmation. Also, the receiver's reply, repeating the instructions, as in: "Read back is as follows..."
RED CAP	Precedence RED CAP.
RELAY (TO)	Re-transmit this message to...
ROGER	I have received and understand all of your last transmission. This should not be used to answer a question requiring a yes or no answer.
ROUTINE	Precedence ROUTINE.
SAY AGAIN	Repeat all of your last transmission. Followed by identification data means "Repeat _____ (portion indicated)."
SPEAK SLOWER	Your transmission is at too fast a speed. Reduce speed of transmission.
SPELL, or I SPELL	Please spell, or "I shall spell the next word phonetically."
STANDBY	I must pause for a few seconds.
THIS IS	This transmission is from the station whose designator immediately follows.
TIME	That which immediately follows is the time or date-time group of the message.
TO	The addressees immediately following are addressed for action.

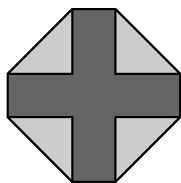
TERM	DEFINITION or MEANING
VERIFY	Verify entire message (or portion indicated) with the originator and send correct version. To be used only at the discretion of or by the addressee to which the questioned message was directed.
WAIT	I must pause for a few seconds.
WAIT OUT	I must pause longer than a few seconds.
WILCO	I have received your signal, understand it, and will comply. To be used only by the addressee. <i>Since the meaning of ROGER is included in that of WILCO, these two prowords are never used together.</i>
WORD AFTER	The word of the message to which I have reference is that which follows _____.
WORD BEFORE	The word of the message to which I have reference is that which precedes _____.
WORDS TWICE	Communication is difficult. Transmit each phrase or each code group twice. This proword may be used as an order, request, or as information.

AIRCRAFT CLOCK POSITIONS

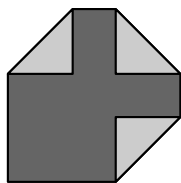


VISUAL SIGNALS

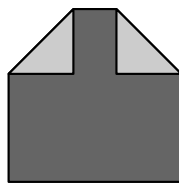
PAULIN SIGNALS



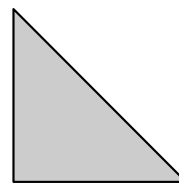
NEED MEDICAL
ASSISTANCE



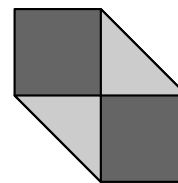
NEED FIRST AID
SUPPLIES



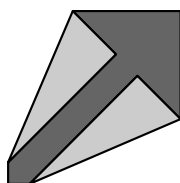
NEED WARM
CLOTHING



NEED FOOD
AND WATER



DO NOT
ATTEMPT



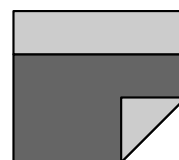
PROCEEDED IN
THIS DIRECTION



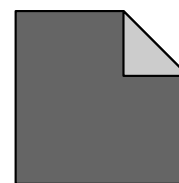
SHOULD WE
WAIT FOR A
RESCUE PLANE?



INDICATE
DIRECTION
OF NEAREST
HABITATION



ABANDONED
PLANE-WALKING
IN THIS
DIRECTION



NEED GAS
AND OIL

EMERGENCY DISTRESS SIGNALS

I Require doctor
Serious injuries

II Require medical
supplies

X Unable to
proceed

F Require food
and water

K Indicate direction
to proceed

↗ Proceeding in this
direction

ID Will attempt
takeoff

□ Aircraft seriously
damaged

L Require fuel and
oil

△ Probably safe to
land here

LL All well

JL Not understood

N No

Y Yes

□ Require map and
compass

! Require signal
lamp

∨ Require firearm
and ammunition

W Require engineer

→→ Information that
A/C in this
direction

↗↘ Divided into 2
groups, in
directions as
indicated

XX Unable to
continue;
returning

++ Have found only
some personnel

LL Have found all
personnel

LLL Operation
complete

NN Nothing found.
Will continue to
search

VISUAL SIGNALS (CONT'D)



Wave Both arms across face
DO NOT ATTEMPT TO LAND



Both arms held over head
PICK UP - PLANE IS ABANDONED



Cup hands over ears
OUR RECEIVER IS WORKING



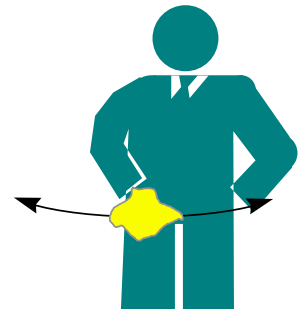
Lie flat on back with hands above head
NEED MEDICAL ASSISTANCE



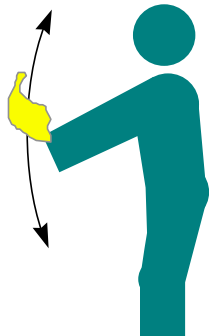
Both arms horizontal
NEED MECHANIC HELP or PARTS



Wave one arm over head
ALL OK - DO NOT WAIT



Wave cloth horizontally
NEGATIVE - NO



Wave cloth vertically
AFFIRMATIVE - YES



Both arms pointing in the direction
of landing while squatting
LAND IN THIS DIRECTION



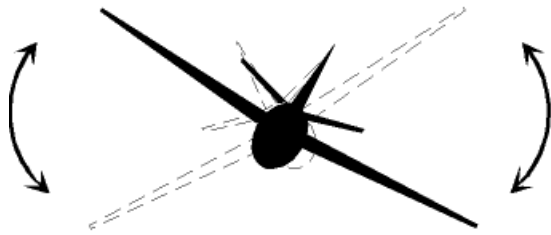
One arm horizontal
WAIT IF PRACTICAL

VISUAL SIGNALS (CONT'D)

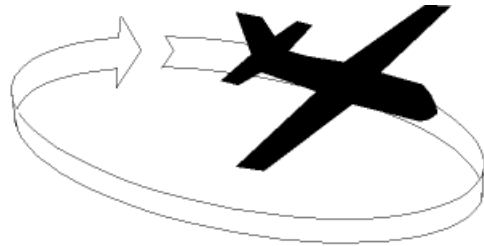
AIR-TO-AIR / AIRCRAFT INTERCEPT VISUAL SIGNALS

INTERCEPTING AIRCRAFT SIGNAL	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
ROCKS WINGS. AFTER ACKNOWLEDGEMENT INITIATES SLOW LEVEL TURN, NORMALLY TO THE LEFT, ONTO DESIRED HEADING.	YOU HAVE BEEN INTERCEPTED. FOLLOW ME.	ROCKS WINGS AND FOLLOWS.	UNDERSTOOD WILL COMPLY.
<i>(AT NIGHT, THE PILOT WILL ALSO FLASH THE NAVIGATIONAL LIGHTS AT IRREGULAR INTERVALS.)</i>		<i>(AT NIGHT, THE PILOT WILL ALSO FLASH NAVIGATIONAL LIGHTS AT IRREGULAR INTERVALS.)</i>	
PERFORMS AN ABRUPT BREAKAWAY MANEUVER; A CLIMBING 90° TURN W/O CROSSING THE INTERCEPTED ACFT'S FLIGHT PATH.	YOU MAY PROCEED.	ROCKS WINGS.	UNDERSTOOD WILL COMPLY.
CIRCLES APT, LOWERS LANDING GEAR, AND OVERFLIES RNWY IN THE DIRECTION OF LANDING.	LAND AT THIS APT.	LOWERS LANDING GEAR, FOLLOWS THE INTERCEPTING ACFT AND LANDS IF THE RNWY IS CONSIDERED SAFE.	UNDERSTOOD WILL COMPLY.
<i>(AT NIGHT, THE PILOT WILL ALSO PUT THE LANDING LIGHTS ON.)</i>		<i>(AT NIGHT, THE PILOT WILL ALSO PUT THE LANDING LIGHTS ON.)</i>	
RAISES LANDING GEAR WHILE FLYING OVER RNWY BETWEEN 1,000' AND 2,000', AND CONTINUES TO CIRCLE THE APT.	THIS APT IS INADEQUATE.	IF THE INTERCEPTED ACFT IS REQUESTED TO GO TO AN ALTERNATE APT, THE INTERCEPTING ACFT RAISES ITS LANDING GEAR AND USES THE INTERCEPT PROCEDURES (LISTED ABOVE).	UNDERSTOOD, FOLLOW ME.
<i>(AT NIGHT, THE PILOT OF THE INTERCEPTED ACFT WILL ALSO FLASH LANDING LIGHTS WHILE PASSING OVER THE RNWY.)</i>		TO RELEASE THE INTERCEPTED ACFT, THE INTERCEPTING ACFT WILL PERFORM THE BREAKAWAY MANEUVER LISTED ABOVE.	UNDERSTOOD, PROCEED.
THE PILOT SWITCHES ON AND OFF ALL AVAILABLE LIGHTS AT REGULAR INTERVALS.	CANNOT COMPLY.	PERFORMS THE BREAKAWAY MANEUVER LISTED ABOVE.	UNDERSTOOD.

AIR TO GROUND SIGNALS



a. Message received and understood



b. Message received but NOT understood

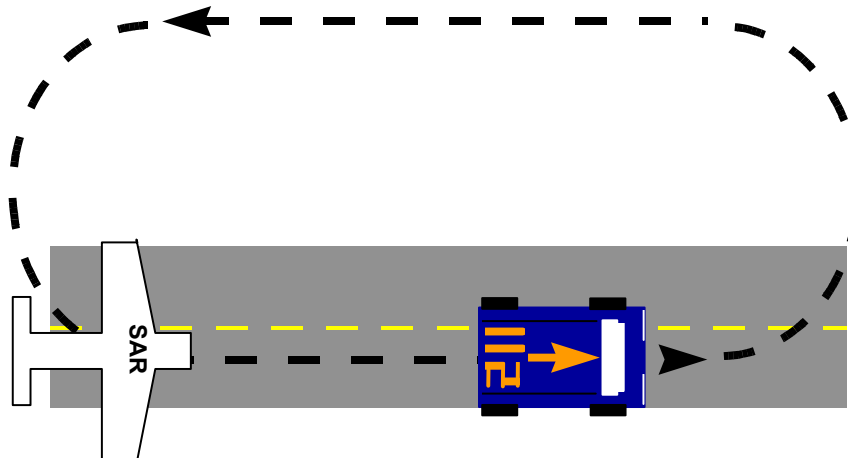


c. Yes or affirmative



d. No or negative

KEEPING UP WITH THE GROUND TEAM

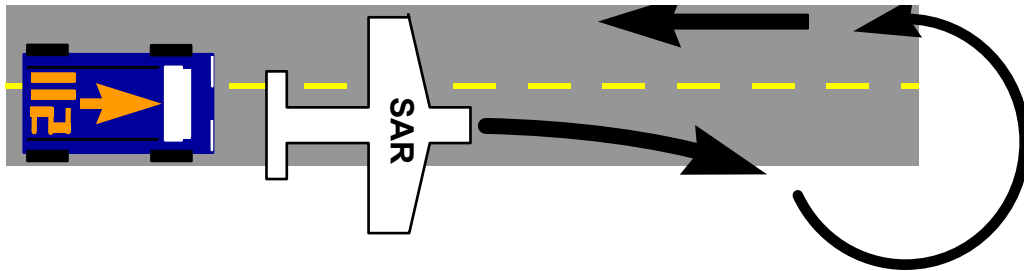


AIRCRAFT ACTION: Aircraft approaches the vehicle from the rear and turns in a normal manner right (or left) to re-approach the vehicle from the rear. Circle back as necessary using oval patterns and flying over the team from behind, indicating that they should continue. The majority of the flight path should be behind the ground team as though the aircraft were “pushing” it. This process of circling back and pushing may be referred to as a “Daisy Chain.” Daisy Chain over the ground team as long as necessary.

DESIRED TEAM ACTION: Continue driving in indicated direction along this road.

AIR TO GROUND SIGNALS (CON'T)

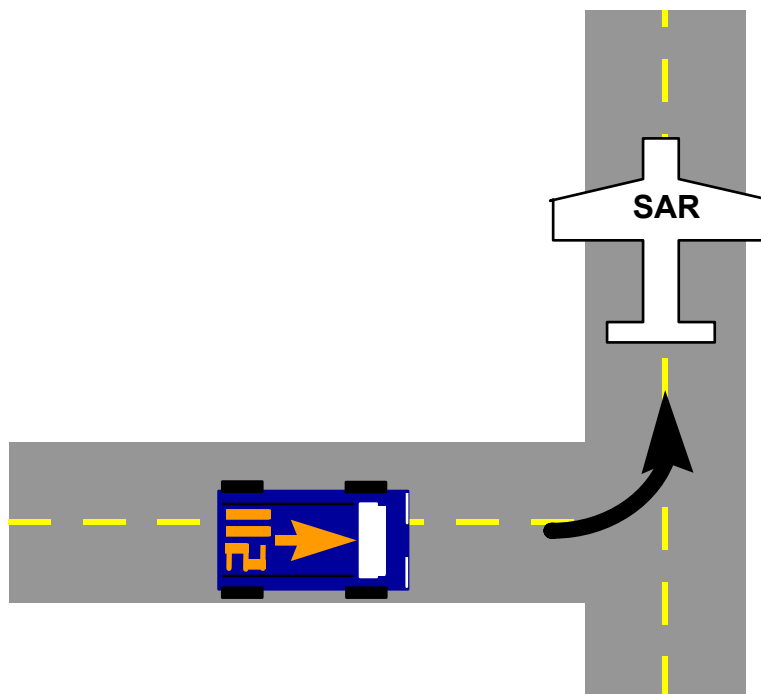
TURNING THE GROUND TEAM AROUND



AIRCRAFT ACTION: Aircraft approaches the vehicle from the rear and then turns sharply right (or left) in front of the vehicle while in motion. Then flies directly at (over) the ground vehicle. Circle back or repeat as necessary flying against the team's direction of travel, then take up the 'keeping up' procedure outlined above.

DESIRED TEAM ACTION: Turn vehicle around and proceed in direction indicated.

TURNING THE GROUND TEAM

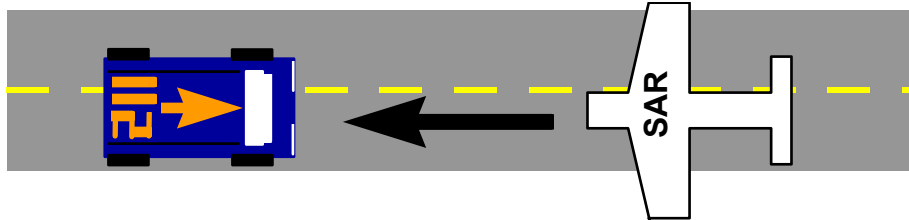


AIRCRAFT ACTION: Aircraft approaches the vehicle from the rear and then turns sharply right (or left) in front of the vehicle while in motion. Circle back as necessary using oval patterns and flying over the team from behind, indicating that they should continue.

DESIRED TEAM ACTION: Turn vehicle to left (or right) at the same spot the aircraft did and then continue in that direction until further signals are received.

AIR TO GROUND SIGNALS (CON'T)

STOP OR DISMOUNT



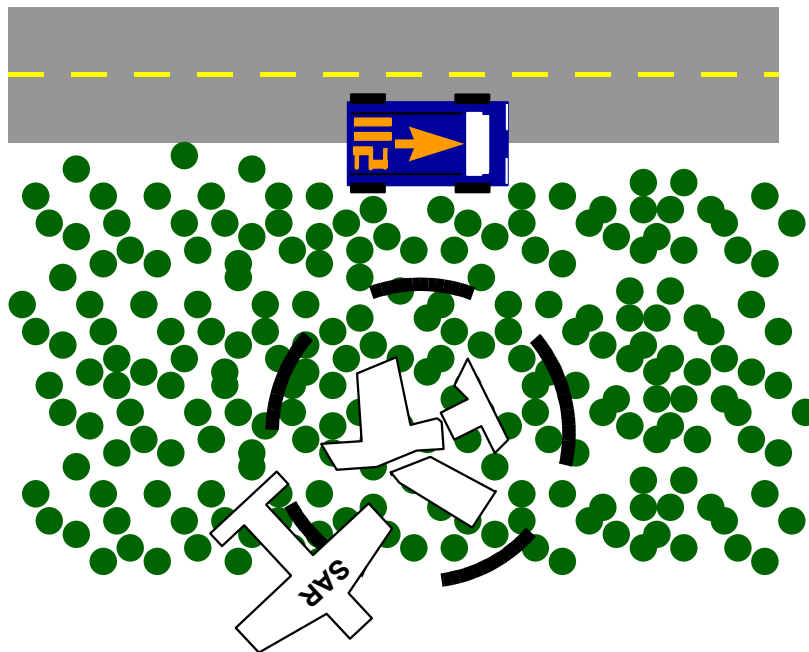
AIRCRAFT ACTION: Aircraft approaches the vehicle low and head-on while the vehicle is moving. This is not to be confused with 'turn around' because aircraft does not perform a 180° turn in front of vehicle.

DESIRED TEAM ACTION: STOP the vehicle and await further instructions

AIRCRAFT ACTION: Aircraft makes two (or more) passes in same direction over a stopped ground team

DESIRED TEAM ACTION: Get out of the vehicle, then follow the aircraft and obey further signals (proceed on foot)

OBJECTIVE IS HERE



AIRCRAFT ACTION: Aircraft circles one geographic place (and continues to circle using turns-about-a-point type procedures)

DESIRED TEAM ACTION: Proceed to the location where the low wing of the aircraft is pointing; that is the location of the target.

AIRDROP PROCEDURES

✓GENERAL GUIDELINES

- OBJECTIVE IS TO GET AIRDROP NEAR THE RECIPIENT OR TARGET AREA. DO NOT AIM DIRECTLY AT RECIPIENT, AS HE/SHE IS NOT EXPECTED TO CATCH THE AIRDROP.
- PROCEDURE SHOULD BE CALM AND DELIBERATE.
- PILOT IS OPERATING THE AIRCRAFT AND NOT FIXATING ON THE TARGET OR THE OBSERVER'S ACTIONS.

ANY CREWMEMBER NOTING AN UNSAFE CONDITION: CALL "NO DROP, NO DROP, NO DROP!"

PILOT WILL CLIMB TO MISSION ALTITUDE, AND RETURN TO DOWNWIND LEG OF AIRDROP TRAFFIC PATTERN.

✓MESSAGE DROP

- MESSAGE DROP SHOULD CONSIST OF A LIGHT OBJECT THAT CAN BE SAFELY DROPPED ATTACHED TO A ROLL OF FLUORESCENT SURVEYOR'S TAPE.
- WRITE A DIRECTIVE MESSAGE AND INCLUDE AN EXPECTED RESPONSE FROM RECIPIENT TO CONFIRM RECEIPT. (SEE 'VISUAL SIGNALS')
- DETERMINE THE WIND DIRECTION AND ATTEMPT TO FLY A TRAFFIC PATTERN INTO THE WIND (IF OBSTACLES PERMIT).
- PILOT CONFIGURES AIRCRAFT WITH 10 DEGREES FLAPS AND 80 KNOTS TO PROVIDE A STABLE PLATFORM.
- FLY ONE RECTANGULAR PATTERN AT 800 AGL TO DETERMINE HAZARDS AND OBSTACLES.
- EXTEND THE BASE TO GIVE A TWO-MILE FINAL TO THE DROP POINT.
- DESCEND TO DROP ALTITUDE, TYPICALLY 500 FEET (TERRAIN PERMITTING) AND OPEN OBSERVER'S WINDOW FOR THE DROP.

AIRDROP PROCEDURES (CONT'D)

✓MESSAGE DROP (CONT'D)

- WHILE ON FINAL, THE OBSERVER WILL CALL "LEFT TURN, STOP TURN" OR "RIGHT TURN, STOP TURN" INSTRUCTIONS TO PILOT.
- WHEN THE RECIPIENT OR TARGET AREA PASSES UNDER THE RIGHT WHEEL, RELEASE THE SURVEYOR'S TAPE FIRST AND PAUSE MOMENTARILY BEFORE RELEASING OBJECT-ENSURES THE FORWARD THROW CARRIES IT PAST THE RECIPIENT (SO IT WON'T HIT THEM).
- THE TAPE UNWINDS AND MAKES A TRAIL TO THE DROP POINT.
- RECONFIGURE, CLOSE THE WINDOW, CLIMB TO MISSION ALTITUDE.

✓EQUIPMENT DROP

- EQUIPMENT DROP IS EXECUTED FOR SURVIVORS NEEDING FIRST AID, SURVIVAL, COMMUNICATIONS EQUIPMENT OR MEDICINE.
- PAD SENSITIVE/FRAGILE EQUIPMENT. EQUIPMENT SHOULD BE PLACED IN A SMALL BAG (LIKE A BACKPACK)
- ATTACHED SURVEYOR'S TAPE TO BAG. THE SURVEYOR'S TAPE WILL LEAVE A TRAIL IN CASE THE KIT IS LOST IN BRUSH, OR TREES
- FOLLOW MESSAGE DROP PROCEDURES. MODIFY AS NECESSARY TO ENSURE THAT AIRDROP IS CONDUCTED IN A SAFE MANNER WITHIN OPERATING LIMITS OF AIRCRAFT.
- DELAY ONE TO TWO SECONDS PRIOR TO RELEASE FOR AN EQUIPMENT DROP.

WARNING! PILOT WILL NOT 'SCORE' THE DROP. RADICAL FLIGHT MANUEVERS MAY RESULT IN A TAIL-STRIKE OR AIRCRAFT STALL.

AIRCREW SURVIVAL BASICS

A. BEFORE FLIGHT

1. Wear appropriate clothing (*Dress to Egress*)
 - a. Don't leave gloves, hats and coats behind; dress for the current *and* forecasted weather (including weather conditions a day or two ahead).
 - b. High boots (combat type) minimize ankle and lower leg injuries both in a crash and when traveling on foot.
2. Check aircraft and personal survival supplies before leaving.
3. File a flight plan (FAA and CAP) so someone will know if you do not return on time. Make sure your course and destination are known.

B. IN-FLIGHT EMERGENCY

1. Attempt to make radio contact.
 - a. Begin radio transmissions at highest possible elevation.
 - b. VHF range: 5 nm on the ground; 40 nm at 1000'AGL; 125 nm at 10,000'AGL.
 - c. If no answer on ATC channel, use 121.5 MHz.
 - d. Transmit MAYDAY (distress) or PAN-PAN (urgency), as appropriate.
 - e. Know your location - check nav aids and GPS.
 - f. Set Transponder to: 7700 (Emergency); 7600 (Lost Communications); or 7500 (Hijack).
 - g. Use CAP FM radio.
 - h. Cell phones will also work, but are better at lower elevations.
2. Prepare for hard/crash landing - DON'T PANIC.
 - a. Seat belts & shoulder harness secure.
 - b. Doors unlatched and slightly open.
 - c. Secure any loose items that may become airborne.
 - d. Know where emergency equipment is located.
 - e. If visibility permits, evaluate the landing area while airborne and look for nearby:
 - 1) clearings
 - 2) water
 - 3) civilization or trails/roads
 - f. Be prepared to exit quickly if fire (or the potential for fire) exists.

C. AFTER LANDING

1. DON'T PANIC, REMAIN CALM
Size up the situation. Proper mental attitude will keep you alive.
2. Treat any serious medical problems.
3. Make sure the ELT is operating.
 - a. Repair antennas if necessary (24" antenna or wire for 121.5 MHz)
 - b. Check Aircraft Radios and Cell phones. Minimize battery use.

AIRCREW SURVIVAL BASICS (CON'T)

4. Inventory all assets. Survival kit, fuel, radios, food, paper, water, and aircraft parts - *everything!*
5. Prepare a plan - think logically.
 - a. Review survival manuals.
 - b. Stay with/near the aircraft, especially if the ELT and/or radios are working.
 - c. Travel *only* if survival chances are *much better* elsewhere.
 - d. Much greater energy will be expended traveling (requires more food and water).
 - e. Obtain shelter (e.g., aircraft body, under the wings, or in a cave).
 - f. Set up a signal plan (e.g., fire, smoke, flares, or signal panels).
 - g. Set up a communications plan (e.g., how often to use the radio and batteries).
 - h. Look for additional sources of water (much more important than food).
 - i. Don't try to travel at night.
 - j. Work and stay as a team.
6. Follow your plan and wait for help to arrive.
 - a. NEVER GIVE UP HOPE!
 - b. Do not think negatively.
 - c. Do things to improve the situation - help is on the way!

URGENT CARE / FIRST AID

If you are prepared to help others you will be better able to care for yourself in case of injury. Even if your condition is so bad that you are unable to care for yourself, you can direct others in the correct procedures.

The first, most important measures to take in the event of an accident are:

1. Do not move a person unless absolutely necessary (e.g., fire, water, smoke or noxious fumes)
2. Ensure the victim has an open airway and give mouth-to-mouth artificial respiration if necessary
3. Check for a pulse and give CPR if necessary
4. Control severe bleeding

The following provide additional directions once emergency measures have been taken to ensure victim's safety:

Do not move the victim unless it is absolutely necessary for safety.

Do not let the victim get up and walk around.

Protect the victim from unnecessary manipulation and disturbance.

Avoid or overcome chills by using blankets or covers.

Determine injuries and administer required first aid.

Plan actions according to the nature of the injury, the needs of the situation, and the availability of human and material resources.

Remain in charge until the victim can be turned over to qualified persons.

Do not discuss the victim's condition with bystanders or reporters

POD CHARTS

MISSION POD CHART

OPEN, FLAT TERRAIN				
Srch Alt. (AGL)	Search Visibility			
Track Spacing	1 mi	2 mi	3 mi	4 mi
500 ft				
0.5 mi	35%	60%	75%	75%
1.0	20	35	50	50
1.5	15	25	35	40
2.0	10	20	30	30
700 ft				
0.5 mi	40%	60%	75%	80%
1.0	20	35	50	55
1.5	15	25	40	40
2.0	10	20	30	35
1000 ft				
0.5 mi	40%	65%	80%	58%
1.0	20	40	55	60
1.5	15	30	40	45
2.0	15	20	30	35

MODERATE TREE COVER/HILLY				
Srch Alt. (AGL)	Search Visibility			
Track Spacing	1 mi	2 mi	3 mi	4 mi
500 ft				
0.5 mi	20%	35%	50%	50%
1.0	10	20	30	30
1.5	5	15	20	20
2.0	5	10	15	15
700 ft				
0.5 mi	20%	35%	50%	55%
1.0	10	20	30	35
1.5	10	15	20	25
2.0	5	10	15	20
1000 ft				
0.5 mi	25%	40%	55%	60%
1.0	15	20	30	35
1.5	10	15	20	25
2.0	5	10	15	20

HEAVY TREE COVER/VERY HILLY				
Srch Alt. (AGL)	Search Visibility			
Track Spacing	1 mi	2 mi	3 mi	4 mi
500 ft				
0.5 mi	10%	20%	30%	30%
1.0	5	10	15	15
1.5	5	5	10	15
2.0	5	5	10	10
700 ft				
0.5 mi	10%	30%	30%	35%
1.0	5	10	15	20
1.5	5	5	10	15
2.0	5	5	10	10
1000 ft				
0.5 mi	40%	60%	75%	80%
1.0	5	10	15	20
1.5	5	10	10	15
2.0	5	5	10	10

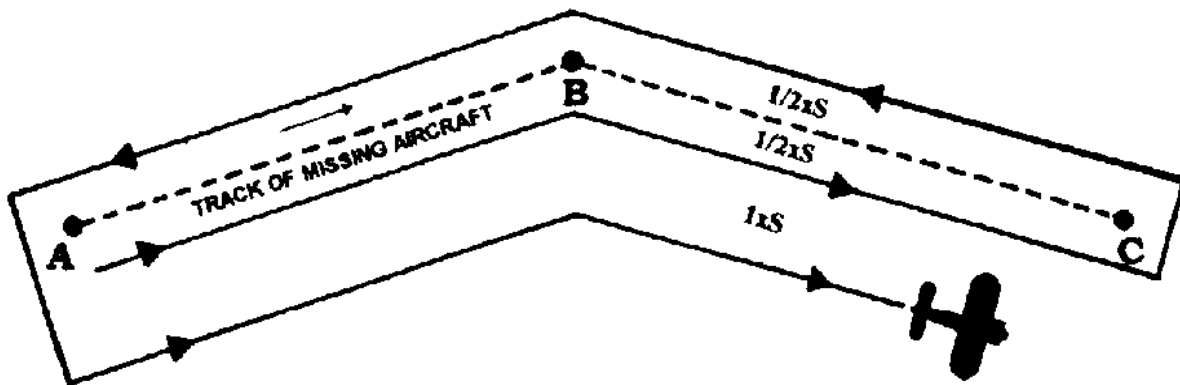
CUMULATIVE POD CHART

Previous, or Cumulative POD		CUMULATIVE POD CHART								
5-10%	15									
11-20%	20	25								
21-30%	30	35	45							
31-40%	40	45	50	60						
41-50%	50	55	60	65	70					
51-60%	60	65	65	70	75	80				
61-70%	70	70	75	80	80	85	90			
71-80%	80	80	80	85	85	90	90	95		
80% +	85	85	90	90	90	95	95	95	95+	
		5-10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	80% +
- -POD THIS SEARCH - -										

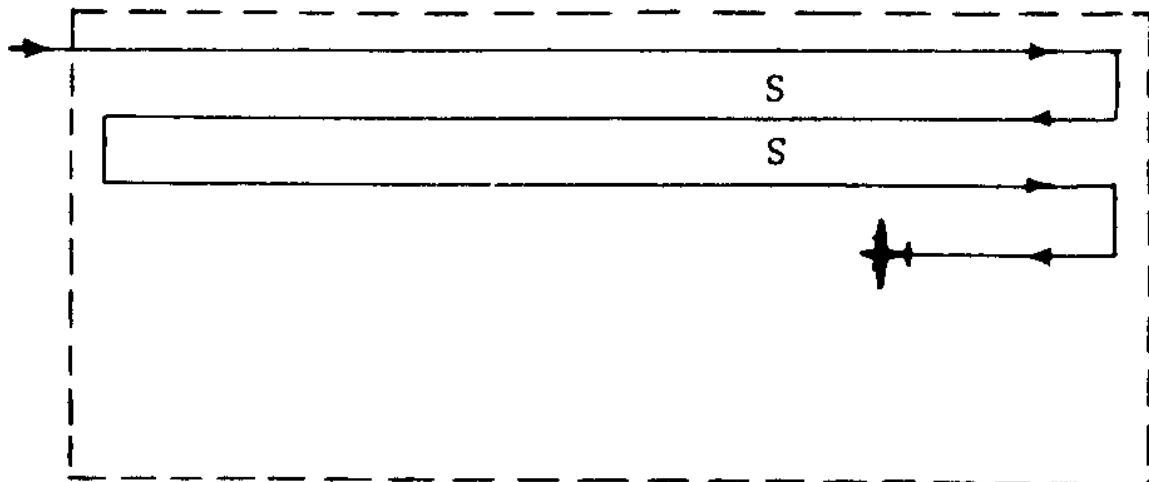
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VISUAL SEARCH PATTERNS

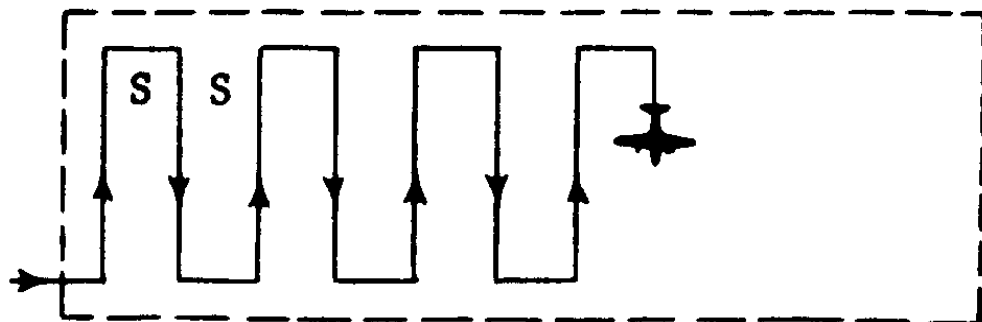
TRACK CRAWL (ROUTE) SEARCH



PARALLEL TRACK OR PARALLEL SWEEP

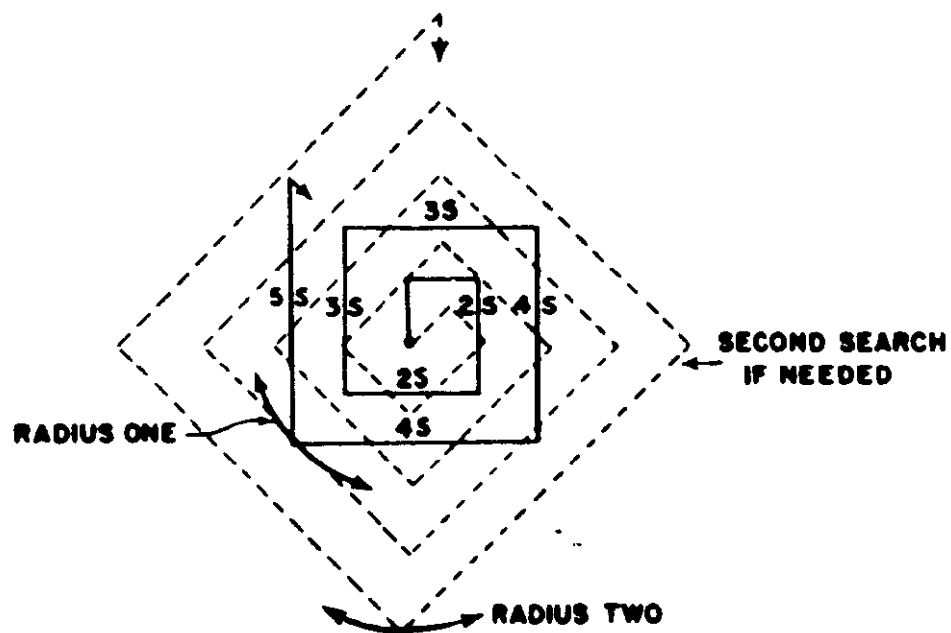


CREEPING LINE

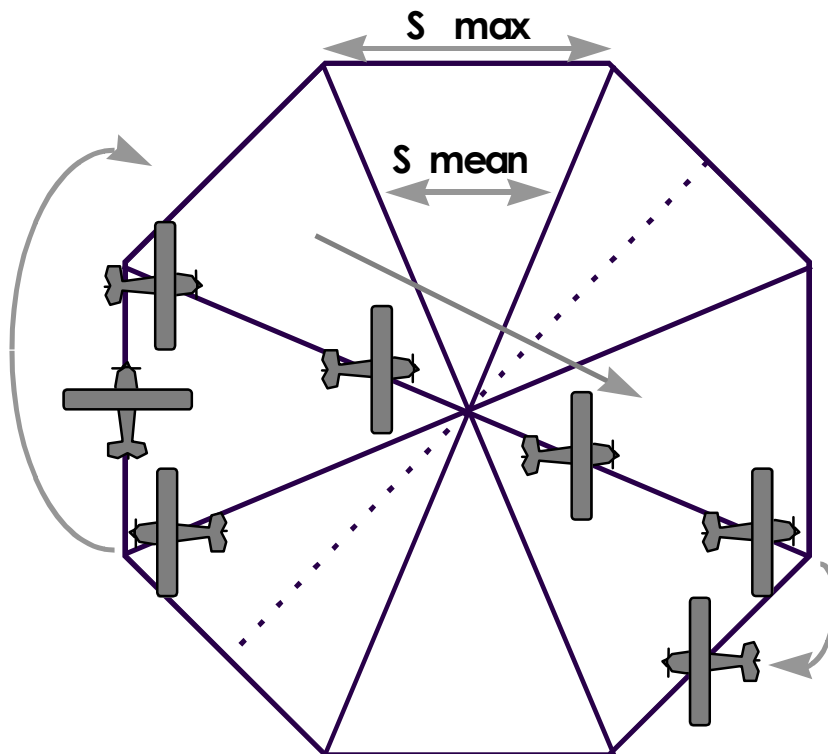


VISUAL SEARCH PATTERNS (CONT'D)

EXPANDING SQUARE



SECTOR SEARCH



APOLLO GX-55 GPS



NOTE: COORDINATE RADIO AND INSTRUMENT OPERATION WITH PIC BEFORE FLIGHT

✓DISPLAY CURRENT POSITION

NAV TO NAVIGATION SCREEN

● - UNTIL GPS POSITION IS DISPLAYED

"PDOP" IS POSITION DILUTION OF PRECISION (PG. 45)

✓SAVE CURRENT POSITION AS A USER WAYPOINT

NAV TO NAVIGATION SCREEN

DB TO DATABASE SCREEN

● - SELECT 'PARALLEL LINE PATTERN'

● - TO CREATE USER WAYPOINT BY LAT/LONG

ENTER

APOLLO GX-55 GPS (CONT'D)

✓SAR MODE SETUP: SET SEARCH AND RESCUE POSITION

PRESS **MAP** SMARTKEY

● – 'MAP SETUP' PAGE

SEL (THE 'ROUTE LINE' SELECTION WILL FLASH)

● - SELECT 'ON'

ENTER

● - TURN COUNTER-CLOCKWISE ONE CLICK TO REACH THE SAR POSITION PAGE

SEL ('LATITUDE VALUE' WILL FLASH)

● - SELECT LATITUDE NEAREST TO SEARCH AREA

● - TO 'LONGITUDE VALUE'

● - SELECT LONGITUDE NEAREST TO SEARCH AREA

ENTER

✓SAR MODE SETUP: SET SEARCH AND RESCUE MAP PAGE

MAP

● – MAP SETUP PAGE

● - COUNTER-CLOCKWISE TO SAR MAP SETUP PAGE

SAR TOGGLES SAR MAP FUNCTIONS 'ON' OR 'OFF'

GRD TOGGLES GRID TYPE FROM 'US' TO 'BASIC'

- US GRID POSITION IS BASED ON SECTIONAL (CAP) GRIDS
- BASIC GRID POSITION IS BASED ON LAT/LON POSITIONS

APOLLO GX-55 GPS (CONT'D)

✓SET SEARCH AND RESCUE MAP PAGE (CONT'D)

POS SELECTS SECTIONAL FOR US GRIDS OR QUADRANT FOR BASIC GRIDS (WHEN USING BASIC, SET QUADRANT TO 'NW')

- - SAR MAP VALUE ON

- - TO 'GRID TYPE'

- - 'US' OR 'BASIC'

- - TURN TO 'POSITION'

- - SELECT GRID POSITION

ENTER

✓SAR POSITION FOR BASIC GRID TYPE

SAR POSITION DEFINES THE SE CORNER OF A 10 X 10 DEGREE GRID

MAP

- - TO 'MOVING MAP SETUP'

LAT ENABLES SELECTION OF LATITUDE OF SE CORNER

- - CHANGE LATITUDE IN INCREMENTS OF 10 DEGREES

ENTER

LON ENABLES SELECTION OF LONGITUDE OF SE CORNER

- - CHANGE LONGITUDE IN INCREMENTS OF 10 DEGREES

ENTER

MAP RETURN TO MAP SCREEN

APOLLO GX-55 GPS (CONT'D)

✓CREATE A USER WAYPOINT BY US GRID

ALLOWS FLYING DIRECTLY TO THE CORNER OF A GRID OR QUADRANT (OR INCLUSION IN A FLIGHT PLAN).

1) ENTER THE SECTIONAL IDENTIFIER IN THE 'SAR MAP SETUP' PAGE BEFORE USING THIS FUNCTION. (E.G., 'DFW')

2) EACH 15° X 15° GRID IS NUMBERED (E.G., '117')

3) EACH GRID IS DIVIDED INTO 7.5° X 7.5° QUADRANTS. NAMED WITH LETTERS A - D, 'A' IS THE NW QUADRANT; MOVE CLOCKWISE FOR THE REST. (E.G., 'A')

3) CORNERS OF QUADRANTS ARE IDENTIFIED AS 1 - 4, BEGINNING IN THE NW QUADRANT AND MOVING CLOCKWISE AROUND THE QUADRANT [1 = NW CORNER; 2 = NE; 3 = SE; 4 = SW]. (E.G., '4')

4) THE FORMAT FOR ENTERING US GRID WAYPOINTS IS [GRID NUMBER][QUADRANT LETTER][CORNER NUMBER].

5) OUR DFW EXAMPLE WOULD BE ENTERED AS '117A4'

NAV TO NAV SCREEN

DB DISPLAY DATABASE SCREENS

● - TO 'CREATE USER WAYPOINT BY US GRID'

ENTER TO ENTER US GRID IDENTIFIER

SEL

● - SELECT INDIVIDUAL CHARACTERS AT FLASHING CURSOR

● - MOVE FLASHING CURSOR TO NEXT POSITION

ENTER ACCEPT CHANGES AND SAVE WAYPOINT

APOLLO GX-55 GPS (CONT'D)

✓MARK A SAR POSITION

AIRCRAFT CURRENT POSITION CAN BE QUICKLY SAVED TO A USER WAYPOINT BY PRESSING THE 'MARK' SMARTKEY ON THE SAR MAP PAGE. AN IDENTIFIER IS AUTOMATICALLY ASSIGNED (THE FIRST ONE IS STORED AS "SAR000" AND THE REST ARE INCREMENTED BY '001' TO PREVENT OVERWRITING. YOU CAN GO BACK AND RENAME LATER.

[MAP] TO MOVING MAP SCREEN

● - SELECT 'SAR MAP'

● - SELECT 'PARALLEL LINE PATTERN'

[MRK] BRINGS UP 'USER WAYPOINT' SCREEN, ENTERS THE PRESENT GPS POSITION AS THE LAT/LONG, AND NAMES IT

[ENTER] TO SAVE WAYPOINT AND RETURN TO 'SAR MAP'

NOTE: DISPLAY OF SAR WAYPOINTS IS CONTROLLED BY THE **[USR]** SMART KEY ON THE MOVING MAP SCREENS.

✓PARALLEL LINE SEARCH PATTERN

SAR MODE SET, STARTING ON THE 'SAR MAP' **SCREEN**

[PAT] 'SEARCH PAGE' SETUP

● - SELECT 'PARALLEL LINE'

[ENTER] TO 'GRID' SETUP

[SEL]

● & ● - SELECT 'GRID NUMBER'

● - TO SELECT 'TRACK SPACING'

● - SELECT FROM 0.2- 9.9 NM

● - SELECT 'DIRECTION OF TRAVEL'

APOLLO GX-55 GPS (CONT'D)

✓PARALLEL LINE SEARCH PATTERN (CONT'D)

- SELECT 'N/S' OR 'E/W'

ENTER TO SAVE INFORMATION

ENTER TO ACTIVATE THE SEARCH PATTERN
(SAR MAP PAGE REACTIVATES)

NOTE: PAT WILL DISENGAGE (ABORT) SEARCH PATTERN

✓CREEPING LINE SEARCH PATTERN

SAR MODE SET, STARTING ON THE 'SAR MAP' SCREEN

PAT 'SEARCH' PAGE SETUP

- SELECT 'CREEPING LINE'

ENTER TO 'GRID' SETUP

SEL ENTER SELECT 'WAYPOINT'

- & ☐- SELECT 'TYPE' AND 'NAME' OF WAYPOINT

ENTER SELECT

- ☐- TO SELECT 'TRACK SPACING'

- SELECT FROM 0.2 - 9.9 NM

- ☐- SELECT 'DIRECTION OF TRAVEL'

- SELECT FROM 0° - 359°

ENTER [Note the diamond on the lower right screen.]

- TO 'LEG LENGTH' AND 'START TURN'

SEL

APOLLO GX-55 GPS (CONT'D)

✓ CREEPING LINE SEARCH PATTERN (CONT'D)

- - SELECT LEG LENGTH FROM 1.0 - 9.9 NM

- - SELECT 'DIRECTION'

- - SELECT 'LEFT' OR 'RIGHT'

TO SAVE INFORMATION

AGAIN TO ACTIVATE SEARCH PATTERN

DISENGAGE (ABORT) SEARCH PATTERN

✓ EXPANDING SQUARE SEARCH PATTERN

SAR MODE SET, STARTING ON THE 'SAR MAP' SCREEN

'SEARCH' PAGE SETUP

- - SELECT 'EXPANDING SQUARE'

SELECT 'WAYPOINT'

- & ○ - SELECT 'TYPE' AND 'NAME' OF WAYPOINT

- - TO SELECT 'TRACK SPACING'

- - SELECT FROM 0.2 - 9.9 NM

- - SELECT 'DIRECTION OF TRAVEL'

- - SELECT FROM 0° - 359°

TO SAVE INFORMATION

TO ACTIVATE SEARCH PATTERN

DISENGAGE (ABORT) SEARCH PATTERN

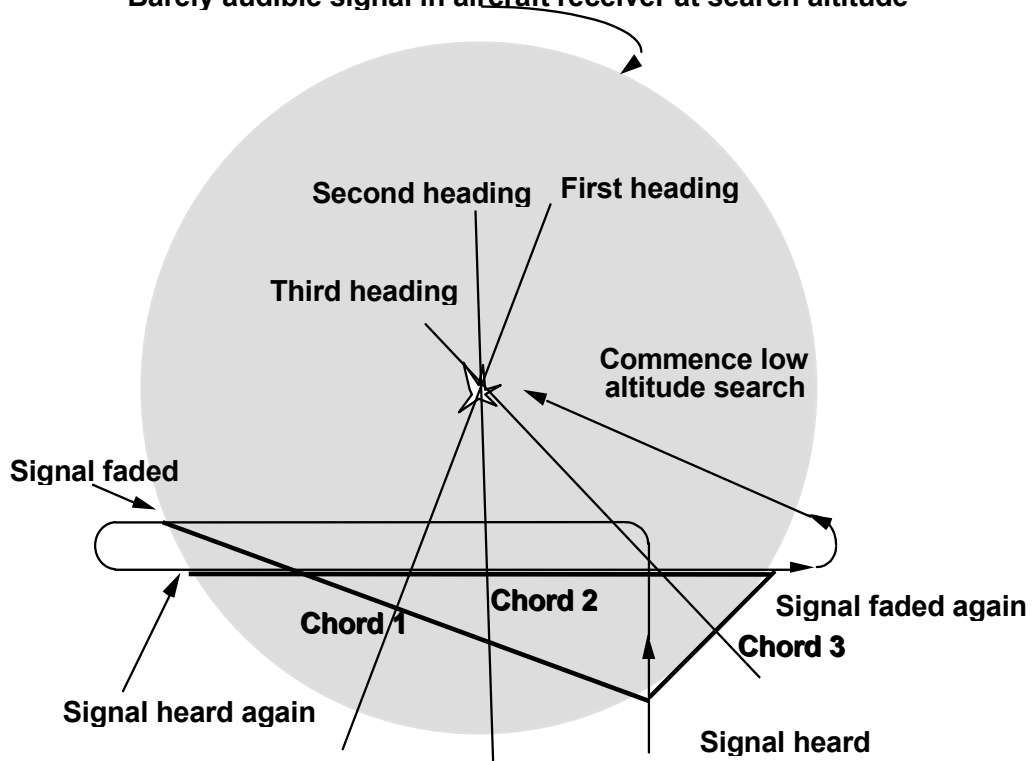
GX-55 GPS: US GRID CHART TABLE

CHART	IDENT	NORTH LIMIT	SOUTH LIMIT	WEST LIMIT	EAST LIMIT	TOTAL GRIDS	GRIDS/ ROW
Seattle	SEA	49°00N	44°30N	125°00W	117°00W	576	32
Great Falls	GTF	49°00N	44°30N	117°00W	109°00W	576	32
Billings	BIL	49°00N	44°30N	109°00W	101°00W	576	32
Twin Cities	MSP	49°00N	44°30N	101°00W	93°00W	576	32
Green Bay	GRB	48°15N	44°00N	93°00W	85°00W	544	32
Lake Huron	LHN	48°00N	44°00N	85°00W	77°00W	512	32
Montreal	MON	48°00N	44°00N	77°00W	69°00W	512	32
Halifax	HFX	48°00N	44°00N	69°00W	61°00W	512	32
Klamath Falls	LMT	44°30N	40°00N	125°00W	117°00W	576	32
Salt Lake City	SLC	44°30N	40°00N	107°00W	109°00W	576	32
Cheyenne	CYS	44°30N	40°00N	109°00W	101°00W	576	32
Omaha	OMA	44°30N	40°00N	101°00W	93°00W	576	32
Chicago	ORD	44°00N	40°00N	93°00W	85°00W	512	32
Detroit	DET	44°00N	40°00N	85°00W	77°00W	512	32
New York	NYC	44°00N	40°00N	77°00W	69°00W	512	32
San Francisco	SFO	40°00N	36°00N	125°00W	118°00W	448	28
Las Vegas	LAS	40°00N	35°45N	118°00W	111°00W	476	28
Denver	DEN	40°00N	35°45N	111°00W	104°00W	476	28
Wichita	ICT	40°00N	36°00N	104°00W	97°00W	448	28
Kansas City	MKC	40°00N	36°00N	97°00W	90°00W	448	28
St. Louis	STL	40°00N	36°00N	91°00W	84°00W	448	28
Cincinnati	LUK	40°00N	36°00N	85°00W	78°00W	448	28
Washington	DCA	40°00N	36°00N	79°00W	72°00W	448	28
Los Angeles	LAX	36°00N	32°00N	121°30W	115°00W	416	26
Phoenix	PHX	35°45N	31°15N	116°00W	109°00W	504	28
Albuquerque	ABQ	36°00N	32°00N	109°00W	102°00W	448	28
Dallas/Ft Worth	GSW	36°00N	32°00N	102°00W	95°00W	448	28
Memphis	MEM	36°00N	32°00N	95°00W	88°00W	448	28
Atlanta	ATL	36°00N	32°00N	88°00W	81°00W	448	28
Charlotte	CLT	36°00N	32°00N	81°00W	75°00W	384	24
El Paso	ELP	32°00N	28°00N	109°00W	103°00W	384	24
San Antonio	SAT	32°00N	28°00N	103°00W	97°00W	384	24
Houston	HOU	32°00N	28°00N	97°00W	91°00W	384	24
New Orleans	MSY	32°00N	28°00N	91°00W	85°00W	384	24
Jacksonville	JAX	32°00N	28°00N	85°00W	79°00W	384	24
Brownsville	BRO	28°00N	24°00N	103°00W	97°00W	384	24
Miami	MIA	28°00N	24°00N	83°00W	77°00W	384	24

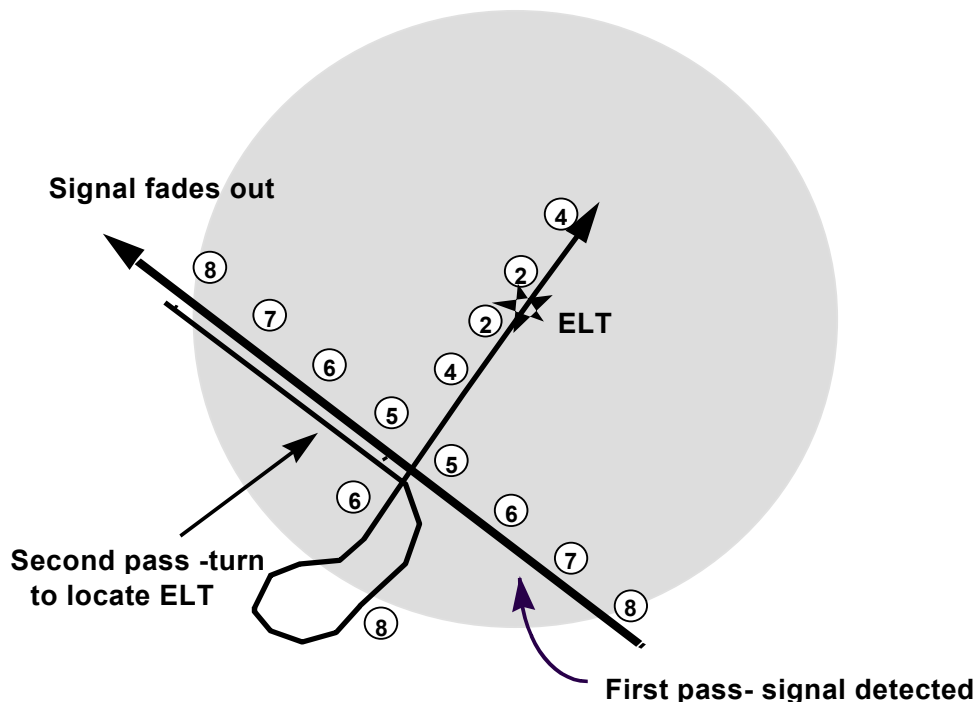
DF SEARCHES

METERED SEARCH

Barely audible signal in aircraft receiver at search altitude

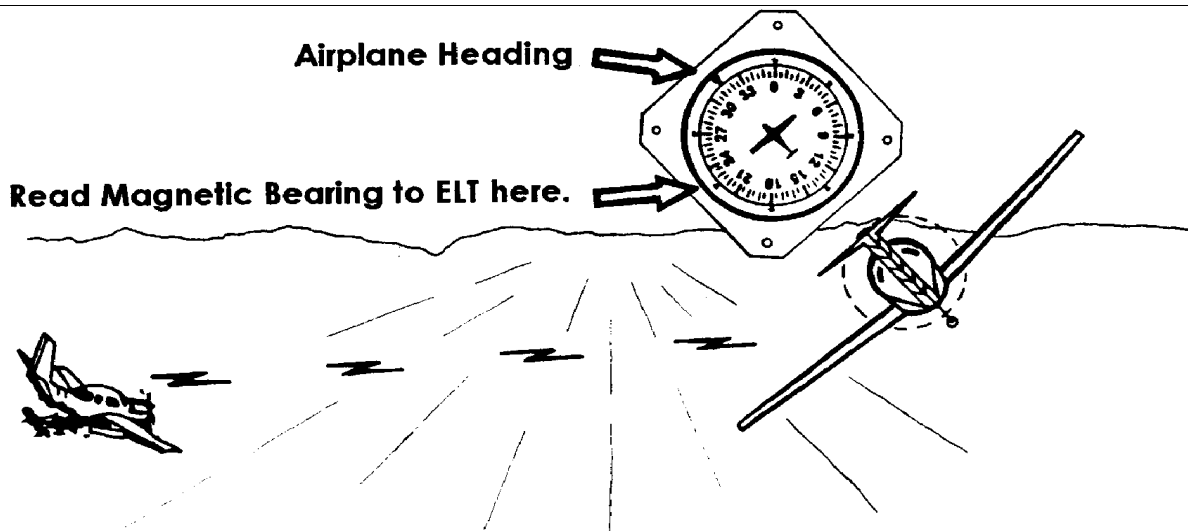
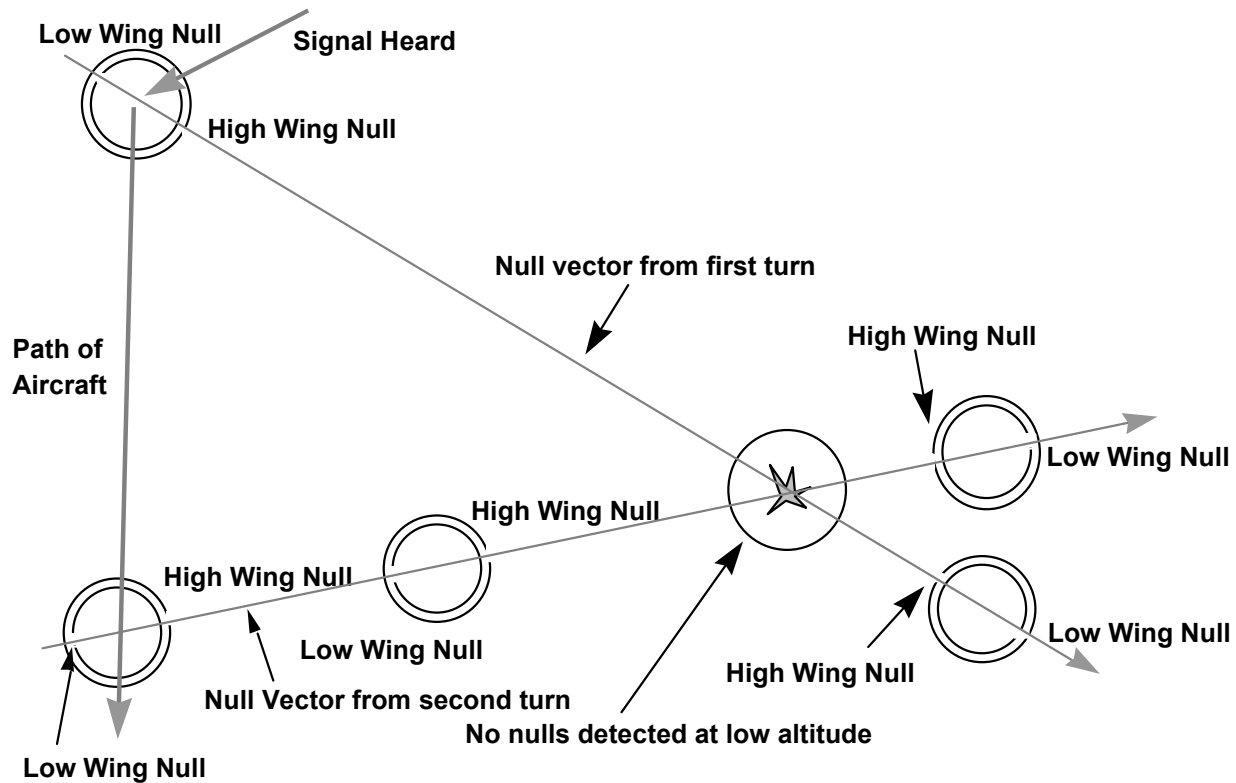


AUDIBLE SEARCH



DF SEARCHES (CONT'D)

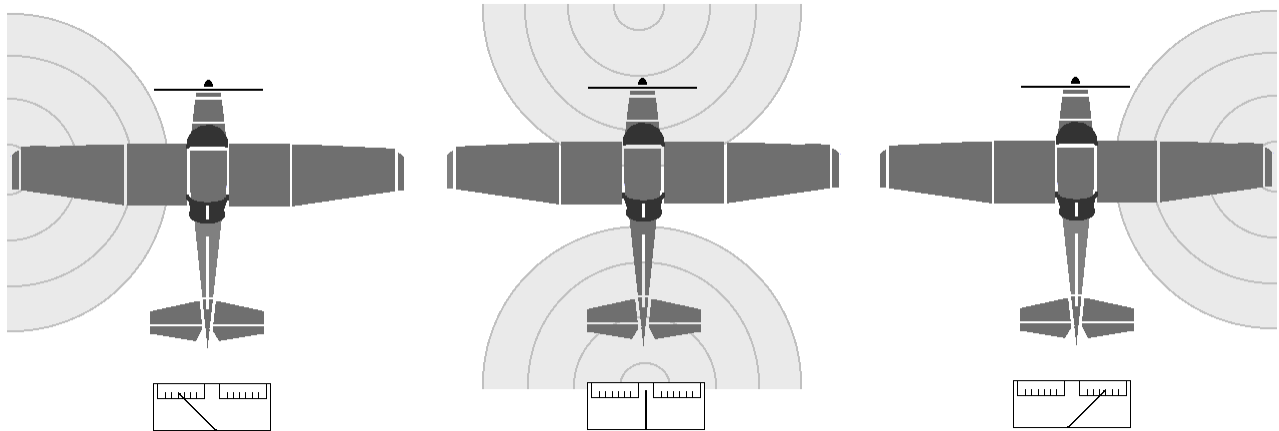
WING NULL PROCEDURE



✈ **HIGH-WING AIRCRAFT** - LEFT TURN, ADD 90° TO AIRCRAFT HEADING WHEN TONE NULLS [RIGHT TURN, SUBTRACT 90°]

✈ **LOW-WING AIRCRAFT** - LEFT TURN, SUBTRACT 90° FROM THE AIRCRAFT HEADING [RIGHT TURN, ADD 90°]

DF SEARCHES (CONT'D)



DIRECTION-FINDING NEEDLE WILL POINT TO THE ELT

“TURN TO TELL” RULE OF THUMB: IF UNSURE WHETHER ELT IS IN FRONT OF OR BEHIND, TURN (LEFT OR RIGHT):

- IF NEEDLE MOVES *OPPOSITE OF TURN*, ELT IS IN *FRONT* OF ACFT.
- IF NEEDLE MOVES *IN DIRECTION OF TURN*, ELT IS *BEHIND* ACFT.

RESOLVING DF AMBIGUITY

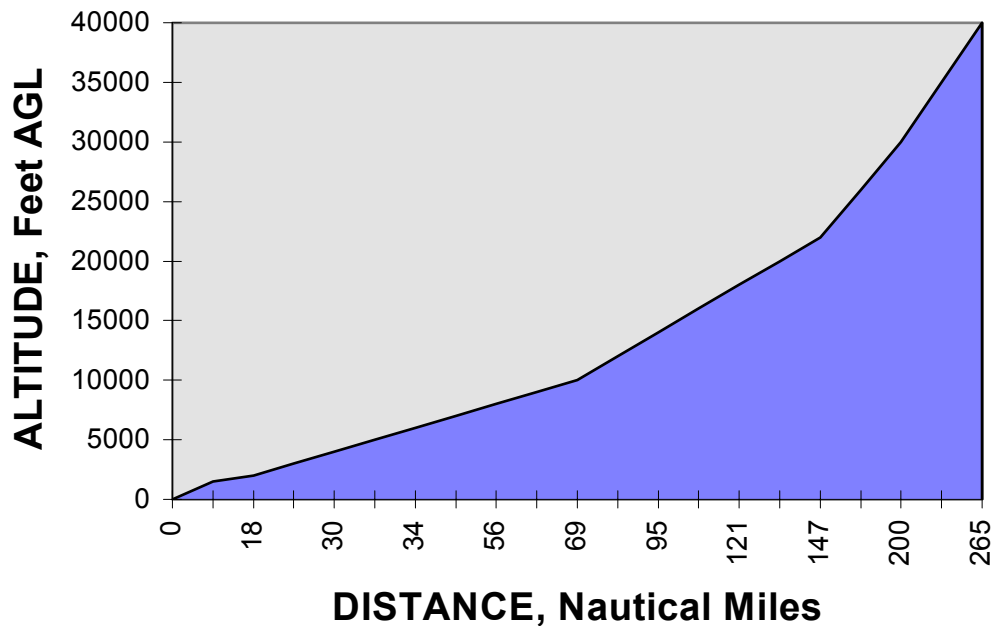
ARE YOU FLYING *TOWARD* OR *AWAY FROM* AN ELT?

	NEEDLE MOVES ◀◀ LEFT	NEEDLE MOVES RIGHT ▶▶
ACFT TURNS RIGHT ▶▶	ELT TO FRONT <i>FOLLOW NEEDLE!</i>	ELT TO REAR <i>TURN 180°</i> ↻
ACFT TURNS ◀◀ LEFT	ELT TO FRONT <i>TURN 180°</i> ↻	ELT TO FRONT <i>FOLLOW NEEDLE!</i>

“CONE OF SILENCE”: AUDIO SIGNAL MAY DISPEAR WHEN AIRCRAFT IS DIRECTLY OVER ELT

DF SEARCHES (CONT'D)

ELT RECEPTION DISTANCE



L-TRONICS VHF DIRECTION FINDER

✓FUNCTIONAL CHECK - NO TRANSMITTER

FREQ - 121.5 MHZ

ALARM - TOGGLE OFF (DOWN)

SENS - MAX

VOL -ON

CHECK SIGNAL STRENGTH (HISSING SOUND ON AUDIO, SIGNAL STRENGTH NEEDLE $\frac{1}{4}$ TO $\frac{1}{2}$ WAY BETWEEN CENTER AND LEFT END. DF NEEDLE CENTERED.

SENS – MIN, THEN MAX (DF NEEDLE SHOULD MOVE SLOWLY AND RANDOMLY BACK AND FORTH.) CHECK AUDIO FOR BACKGROUND NOISE.

ALARM- TOGGLE ON (UP). LIGHT SHOULD FLASH FOR 10 TO 20 SECONDS AND THEN STOP.

L-TRONICS VHF DF (CONT'D)

WARNING! USE OF HIGH-POWER TRANSMITTERS CLOSE TO THE DF ANTENNAE CAN DAMAGE THE UNIT. DAMAGE CAN OCCUR FROM A 50-WATT TRANSMITTER IF IT IS WITHIN 12 FEET OF THE ANTENNAE (3 FEET FOR 5W; 4 1/2 FEET FOR 10W; 15 FEET FOR 80W). ELT TESTER SHOULD BE KEPT AT LEAST 50 FEET AWAY FROM THE ANTENNAE WHEN USING TO TEST FOR OPERABILITY OF THE DF

✓FUNCTIONAL CHECK - WITH TRANSMITTER

PARK AIRCRAFT IN THE OPEN, AWAY FROM METAL BUILDINGS, WITH XMITTER AT LEAST 50' IN FRONT OF AND 15° - 30° TO ONE SIDE OF THE AIRCRAFT.

FREQ - 121.775 MHZ

SENS - MIN

VOL - MID SCALE

ALARM - TOGGLE DOWN

VOL - ON

SENS - ADJUST UNTIL AUDIBLE

DF NEEDLE SHOULD POINT TOWARD THE XMITTER. DIRECT PERSONNEL TO MOVE XMITTER TO THE OTHER SIDE OF THE AIRCRAFT. DF NEEDLE SHOULD FOLLOW XMITTER. NEEDLE MAY NOT CENTER WITH TEST XMITTER DIRECTLY FORE OR AFT. DF IS OK IF THE NEEDLE POINTS CORRECTLY WHEN THE XMITTER IS ON EITHER SIDE OF THE AIRCRAFT.

SENS - TURN CLOCKWISE (STRENGTH NEEDLE SHOULD MOVE)

✓NORMAL FLIGHT OPERATION

FREQ - 121.5 MHZ (121.775 MHZ FOR TRAINING MISSIONS)

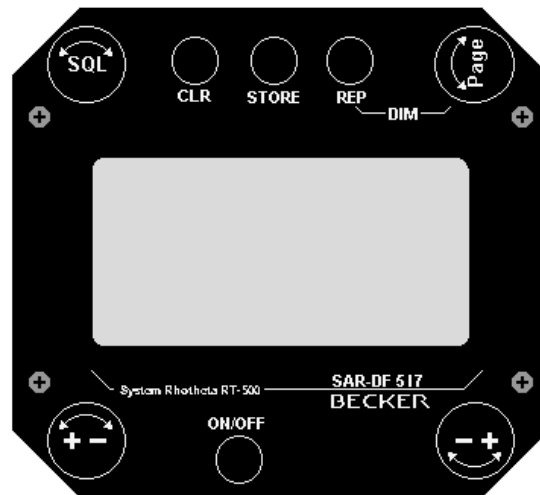
ALARM - TOGGLE UP (DOWN FOR DF MODE)

SENS - MAX

VOL - MID SCALE

DF NEEDLE WILL DRIFT SLIGHTLY LEFT AND RIGHT

BECKER SAR DF-517 CONTROL DISPLAY UNIT (CDU)



SQL – SQUELCH LEVEL

CLR – ERASE CURRENT MESSAGE ON DISPLAY

STORE – STORE CURRENT MESSAGE ON DISPLAY (OVERWRITES PREVIOUS MESSAGE)

REP – CURRENTLY STORED MESSAGE WILL BE DISPLAYED

PAGE – SELECT PAGE ON VIEWSCREEN

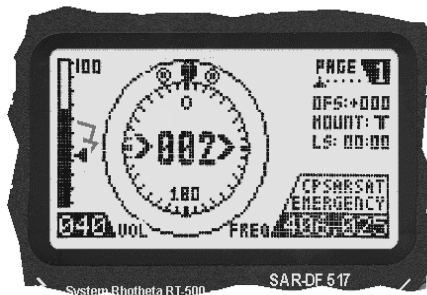
LOWER LEFT KNOB – ADJ VOLUME

LOWER RIGHT KNOB – ADJUST FREQUENCY



POWER-ON/OPERATION MODE

BECKER SAR DF-517 CDU (CONT'D)



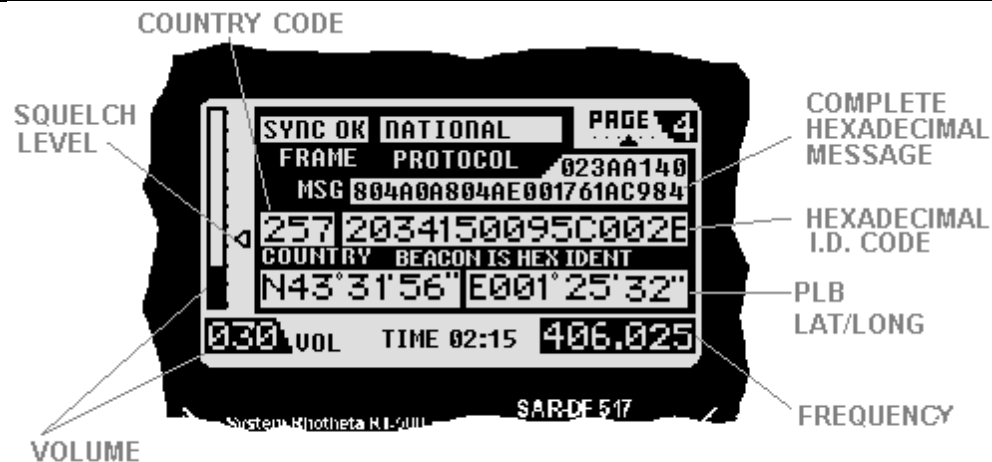
PAGE 1: 360 DEGREE VIEW



PAGE 2: 90 DEGREE VIEW



PAGE 3: DIGITAL READING



PAGE 4: COSPAS/SARSAT MODE

EMERGENCY-MODE WITH FIXED EMERGENCY FREQUENCIES

156.800 MHZ (CH16/SEABAND)

121.500 MHZ (VHF)

243.000 MHZ (UHF)

406.025 MHZ (CP/SARSAT)

*SCAN-MODE (CONCURRENTLY MONITORS 121.5, 243.00, & 406.025)

TRAINING-MODE WITH ADJUSTABLE TRAINING FREQUENCIES

[156 ... 158] MHZ

[118 ... 123] MHZ

[240 ... 246] MHZ

[400 ... 410] MHZ

BECKER SAR DF-517 CHECKLIST

WARNING! - UNIT OFF DURING ENGINE START-UP/SHUT-DOWN

✓POWER-UP

☐ ON/OFF SWITCH – ON

☐ PAGE ROTARY SWITCH – SELECT MODE (EMERGENCY/TRAINING)

✓OPERATION MODE

☐ DIM - DEPRESS <REP> WHILE ADJ BRIGHTNESS WITH <PAGE>

☐ PAGE – SELECT AS REQUIRED

✓PAGES 1 TO 3 - BEARING MODE (SEE ILLUSTRATIONS)

☐ SQL – SET SQUELCH LEVEL AS DESIRED

☐ VOL (LOWER LEFT KNOB) – AS REQUIRED

☐ FREQ (LOWER RIGHT KNOB) – AS REQUIRED

***NOTE – DF BEARINGS ARE RELATIVE TO ACFT (0 DEGREES IS OFF THE NOSE, 180 DEGREES IS OFF THE TAIL, ETC.)**

✓PAGE 4 - COSPAS/SARSAT MODE (SEE ILLUSTRATION)

☐ CLR – PRESS TO CLEAR STORED MESSAGES

☐ STORE – PRESS TO STORE CURRENT MESSAGE ON DISPLAY

⊘ PAGE 5 - SYSTEM CONFIGURATION*

***FOR USE BY AUTHORIZED PERSONNEL ONLY!!**

BECKER SAR DF-517 CHECKLIST (CONT'D)

✓PAGE 6- TRAINING FREQUENCY SETTING (SEE FREQ. TABLES)

VOL (LOWER LEFT KNOB) – SELECT FREQUENCY BAND

FREQ (LOWER RIGHT KNOB) – TUNE FREQUENCY

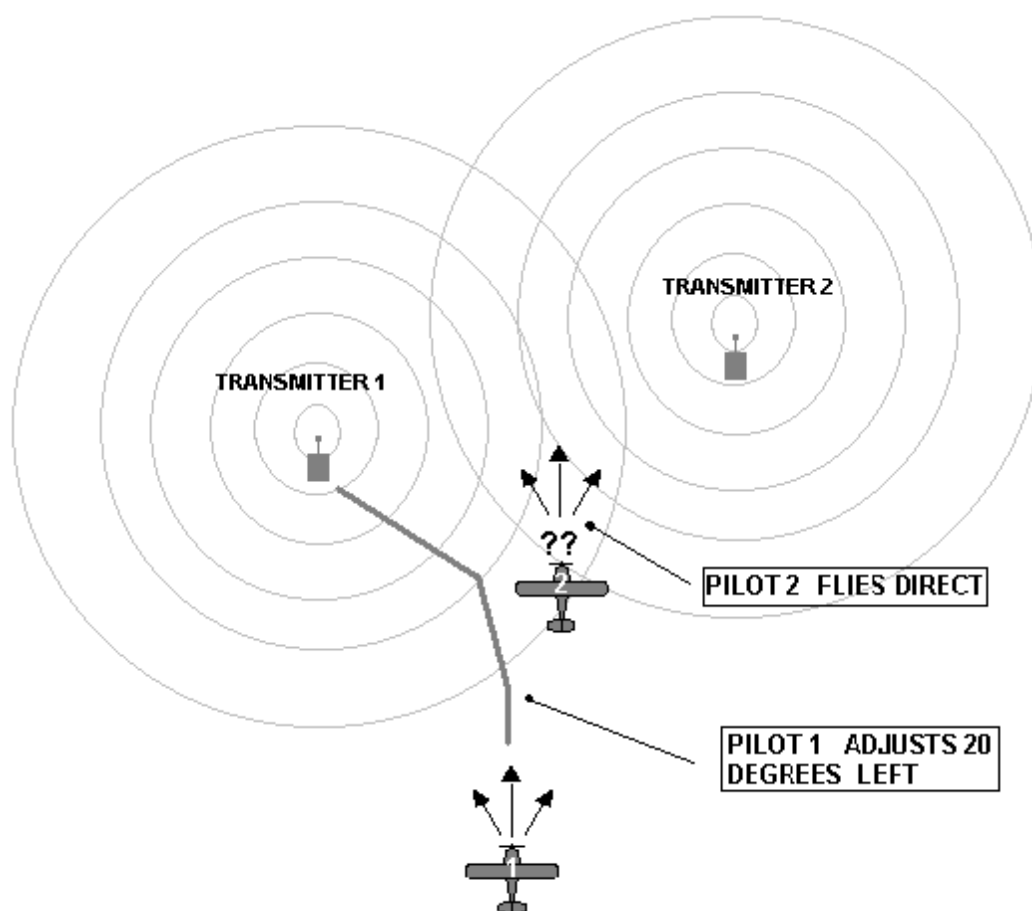
STORE- CONFIRM CHANGES VALUES

<ERROR MESSAGE>

IF ANY OF THE FOLLOWING CODES DISPLAY ON CDU, RECORD DATA, TURN UNIT OFF AND FWD DATA TO MAINTENANCE PERSONEL.

ERROR MESSAGE	ERROR, LOCATION	REASON
ERROR 10 E10:VOLT/D	MAIN VOLTAGE SUPPLY	VOLTAGE INPUT TOO LOW ($\leq 10.0V$)
ERROR 9 E9:NO DATA	CONNECTING CABLE TO ANTENNA DISPLAY OR CDU	NO OR DAMAGED CONNECTION BETWEEN ANTENNA AND CDU, OR DAMAGED CDU
ERROR 8 E8:BAD/ANT	CONNECTING CABLE: ANTENNA \leftrightarrow DISPLAY	INCOMPATIBILITY OF ANTENNA AND DISPLAY RESP. BAD CONNECTION OF DISPLAY AND ANTENNA
ERROR 7 E7:BAD/DIS	CDU	INCOMPATIBILITY OF ANTENNA AND CDU
ERROR 6 E6:VOLT/A	ANTENNA	VOLT SUPPLY AT ANT. TOO LOW ($\leq 9.0 V$). MAIN VOLT SUPPLY TOO LOW OR VOLTAGE DROP BETWEEN CDU AND ANTENNA
ERROR 5 E5:OSCILAT	ANTENNA	ERROR IN SYNTHESIZER-OSCILLATOR OF RECEIVER IN ANTENNA-UNIT
ERROR 4 E4:F/+OFS+	RECEIVED TRANSMITTER	RECEIVED FREQUENCY TOO HIGH (MORE THAN 6 KHZ / ERROR OF TRANSMITTER
ERROR 3 E3:F/-OFS-	RECEIVED TRANSMITTER	RECEIVED FREQUENCY TOO LOW ($> 6KHZ$ / OF XMTR ERROR)
ERROR 2 E2:CS/SYNC	RADIO DISTANCE: TRANSMITTER \leftrightarrow DF	SYNCHRONISING BITS OF COSPAS/SARSAT SIGNAL (BIT 1 TO 24) DEFECTIVE
ERROR 1 E1:CS/BCH1	RADIO DISTANCE: TRANSMITTER \leftrightarrow DF	ERROR OF DATA BITS IN 1ST COSPAS/SARSAT DATA BLOCK PDF1/BCH1
ERROR 0 E0:CS/BCH2	RADIO DISTANCE: TRANSMITTER \leftrightarrow DF	ERROR OF DATA BITS IN 2 ND COSPAS/SARSAT DATA BLOCK PDF2/BCH2

BEARING ON MORE THAN ONE TRANSMITTER



- IF BEARING FROM A LONG DISTANCE, THE DF WILL BE POINTING AT THE MIDDLE OF THE TWO TRANSMITTERS
- EXACTLY IN THE MIDDLE BETWEEN TWO TRANSMITTERS, THE DF WILL DISPLAY AN UNUSABLE BEARING VALUE
- EXACTLY OVER ONE TRANSMITTER THE DF WILL BE POINTING TO ANOTHER (GARBLING CONE)

<FLIGHT TACTICS>

DON'T FLY THE APPROACH EXACTLY FOLLOWING THE INDICATED AVERAGED BEARING-VALUE, BUT ABOUT 20° LEFT OR RIGHT

BASIC GROUND ELT SEARCH

1. Assemble the LH-16 on the antenna mast assembly and hold vertically in front of you, such that you can see the receiver controls.
2. Turn the unit on, turn the Volume and Sensitivity full up, set the Mode knob to DF. Set the Frequency knob to the appropriate frequency: 121.5 or 243 MHz, or 121.775 MHz for practice beacons; 121.5 or 243. Listen for the distress beacon signal. If you have no signal, move to some other location where you do. [Note: 243 MHz is the harmonic transmitted by a 121.5 distress beacon; military distress beacons use 243 but many military aircraft carry civilian distress beacons that transmit on both frequencies.]
3. Once you have the signal, swing the antenna slowly through a full circle around you and determine where the needle centers. If it centers more than twice, analyze your location to determine if you might be dealing with more than one signal, reflections or interference from power lines. Remember all directions where the needle centers.
4. Switch to the REC Mode and determine where the signal strength is greatest (needle deflected farthest to the right, signal direction is off the left antenna mast). The strongest signal direction should be in one of the same directions that the needle centered in the DF Mode.
5. Switch back to the DF Mode and locate where the needle centers in the direction where the REC mode received a maximum signal. While one person keeps the unit aligned on the signal, another stands behind her and takes a compass bearing.
6. As you get closer to the signal, decrease the sensitivity to avoid overloading the receiver.

ONCE YOU'RE CLOSE

1. Use a short antenna (such as a "rubber duck" flexible antenna). Ensure you can hear the signal of the distress beacon. Adjust the Sensitivity and Volume so that you can barely hear the signal.
2. Use "body blocking" to determine a bearing to the distress beacon by placing the receiver at waist level and rotating in a circle until the weakest signal is heard. At this point the target distress beacon should be directly behind you, since your body is blocking the signal from the distress beacon. [This is like a wing null.]
3. Use the "signal strength" method if you are sure the distress beacon is located nearby (e.g., if you are at an airfield and you are sure it is in one of the planes in a hanger). If the signal strength increases rapidly you are getting closer to the distress beacon. Decrease the Sensitivity (or increase squelch), reduce the antenna height, or slightly offset receiver frequency to permit more efficient body blocking.
4. You may also use a hand-held radio for a close-in search. Sometimes, like when you are in a hanger full of aircraft, this is actually a better tool than the L-Per. Body blocking, removing the antenna, and using frequency offset all work with a hand-held radio.

Hold the radio by one of the suspect aircraft's ELT antenna and turn the volume down until you can just hear the signal, then move to the next suspect aircraft and hold the radio next to its antenna. If

BASIC GROUND ELT SEARCH (CON'T)

the signal is stronger you probably have it; if it is weaker or cannot be heard it's probably the other aircraft. You may also incorporate portions of the signal-offset method with this method. [Warning: Do not key the radio's transmitter while the antenna is removed!]

Don't ignore the obvious: some aircraft have remote indicating lights (usually red) that flash when the ELT has activated; also look for obvious signs of disturbance near an ELT.

Regardless of the methods and equipment used, you may have trouble locating and ELT once you get very close. ELTs are sometimes notoriously difficult to find when you have several aircraft within a row or several hangars. You can discuss techniques for this type of search with your local ground team or simply wait for them to arrive, since you have absolutely determined that this isn't a distress situation and no life is at stake.

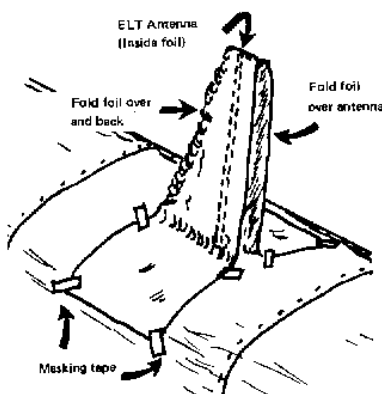
SILENCING AN ELT

Once you have determined which aircraft the signal is coming from, you have to find the (physical) ELT. Most are located in the rear of the aircraft; also look for remote switches. The following gives some general directions:

- Single-engine Cessna: right side of the upper baggage area immediately aft of the baggage door.
- Multi-engine Cessna: left side of the fuselage just forward of the horizontal stabilizer. Accessed through a small push-plate on the side of the fuselage.
- Single- and multi-engine Piper: in the aft fuselage. Accessed through a small access plate on the right side of the fuselage (requires a screwdriver).
- Single- and multi-engine Bonanza: in the aft fuselage. Accessed through a small access plate on the right side of the fuselage (requires a screwdriver).
- Large piston twins (e.g., King Air) or small jets: if installed its probably in the rear section. No visible antenna. May have a small round push-plate that allows you to access to the switch with your finger.

The preferred method of silencing a transmitting ELT is to have the owner (or a person designated by the owner) turn it off and disconnect the battery; second best is just turning it off. Some owners will take the switch to OFF and then back to ARMED; monitor the emergency frequency for several minutes afterwards to ensure the ELT doesn't resume alarming.

If you cannot find the owner (or designee), you may have to install an aluminum foil 'tent' to limit the ELT signal range:



BASIC GROUND ELT SEARCH (CON'T)

Take a piece of foil about one foot wide by about five feet long. Place the tip of the ELT antenna in the center of the foil and fold the foil down on both sides of the antenna. Let the ends lay flat against the fuselage; the flaps *must* extend at least 18" beyond the antenna. Fold the two sides of the 'tent' together to completely enclose the antenna and *securely* tape the foil to the fuselage (use a tape that won't damage the paint, such as masking tape).

Whatever you do, *do not leave an ELT/EPRIB in the alarm state unless ordered to do so by the IC/AFRCC*. You will have to consult your IC, AFRCC, and/or law enforcement to silence the ELT if the above methods are not practical.

Last but not least, ensure the aircraft owner is notified that the ELT was disabled. If you can't obtain a phone number, you can leave a note on the aircraft (not a window) stating that the ELT has been disabled.

LEGAL ISSUES

CAP members must not enter private property (except to save a life) and should not do anything that could cause harm or damage to the distress beacon or aircraft/boat. If entry is required the owner/operator or local law enforcement officials will make it. [In some cases, especially at an airport, FBO personnel have permission to enter aircraft on the premises and can assist you.]

Law enforcement authorities such as local police, the county sheriff's office or game wardens may be contacted for assistance. [If they are not familiar with CAP and your responsibilities, a simple explanation often suffices. If this doesn't work, try calling AFRCC and have them explain the situation. If, for whatever reason, you cannot gain access -- call your IC.]

NOTE: A *crashed* aircraft is under the authority of the National Transportation Safety Board (NTSB) *and no one else*. Federal law permits the NTSB to request assistance from federal, state and local agencies (including CAP) to secure a crash site.

Although not your responsibility, owners may ask you whether or not they can fly with a deactivated or inoperative ELT; the rules are found in FAR 91.207. An aircraft with an inoperable ELT can be ferried from a place where repairs or replacements cannot be made to a place where they can be made [91.207(3)(2)]. An aircraft whose ELT has been temporarily removed for repair can be flown if aircraft records contain an entry concerning the removal, a placard is placed in view of the pilot showing "ELT not installed," and the aircraft is not operated more than 90 days after the ELT was removed [91.207(f)(10)].

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FLIGHT GUIDE

FORMS



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ELT SEARCH INFORMATION REQUIRED BY AFRCC

Once an ELT has been located, certain information needs to be collected. Contact the Incident Commander with any of this information that you can gather. He or she will also relay to you the appropriate action for silencing the ELT.

Date and time (Zulu) that you left on the sortie	
Date and time the ELT/EPIRB was first heard	
Number of aircraft [IC]	
Number of sorties [IC]	
The time in the search area (hours and tenths)	
The time enroute (hours and tenths)	
Total flight hours (Hobbs)	
Number of CAP personnel [IC]	
Area(s) searched	
Actual location of the ELT/EPIRB, including lat/long	
Date and time the ELT/EPIRB was located	
Date and time the ELT/EPIRB was silenced	
ELT/EPIRB model, manufacturer, serial number, and expiration date	
Position of ELT/EPIRB switch: ON, ARMED or OFF	

Other useful information:

1. The type of airplane or boat that contained the ELT/EPIRB.
2. The 'N' number or hull number of the airplane or boat.
3. Names of law enforcement officers and other personnel that assisted you (add to your list for future missions).
4. The name, address, and phone number for the owner of the ELT/EPIRB. *
5. The cause of activation (e.g., mishandling, damaged unit, broken switch, or hard landing) *

* If information can be easily obtained.

Observer Log

[illegible]

Mission Pilot Search Area Work Sheet

Date:

A/C#

MISSION #

MSN PILOT:

SORTIE:

PILOT/OBS:

SECTIONAL:

OBS/SCN:

GRID:

A B C D

OBS/SCN:

CAP FLIGHT #

FREQUENCY

AIRPORT NAME:

CLEARANCE DEL:

CITY:

APPROACH:

IDENTIFIER:

TOWER:

AIRSPACE:

GROUND:

ELEVATION:

DEPARTURE:

UNICOM FREQ:

FSS:

FREQ:

ATIS/AWOS/ASOS:

CTR:

FREQ:

HOBBS IN:

TACH IN:

OUT:

OUT:

TOTAL:

TOTAL:

Observer/Scanner Search Area Work Sheet

Date ____ / ____ / ____

A/C # _____ SORTIE # _____

MSN PILOT: _____ SECTIONAL: _____

PILOT/OBS: _____ GRID # _____

OBS/SCN: _____ *CAP FLIGHT* # _____

OBS/SCN: _____ *FREQUENCY* _____

<i>SEARCH NUMBER</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
----------------------	----------	----------	----------	----------

<i>START</i>	TIME	_____	_____	_____	_____
--------------	------	-------	-------	-------	-------

	HOBBS	_____	_____	_____	_____
--	-------	-------	-------	-------	-------

<i>TAKEOFF</i>	TIME	_____	_____	_____	_____
----------------	------	-------	-------	-------	-------

	HOBBS	_____	_____	_____	_____
--	-------	-------	-------	-------	-------

<i>IN AREA</i>	TIME	_____	_____	_____	_____
----------------	------	-------	-------	-------	-------

	HOBBS	_____	_____	_____	_____
--	-------	-------	-------	-------	-------

<i>OUT OF AREA</i>	TIME	_____	_____	_____	_____
--------------------	------	-------	-------	-------	-------

	HOBBS	_____	_____	_____	_____
--	-------	-------	-------	-------	-------

<i>LAND</i>	TIME	_____	_____	_____	_____
-------------	------	-------	-------	-------	-------

	HOBBS	_____	_____	_____	_____
--	-------	-------	-------	-------	-------

<i>SHUT DOWN</i>	TIME	_____	_____	_____	_____
------------------	------	-------	-------	-------	-------

	HOBBS	_____	_____	_____	_____
--	-------	-------	-------	-------	-------

Observer/Scanner Search Area Work Sheet

Mission # _____

Total Hobbs Time _____

	Name	Phone #
Safety Officer	_____	_____
Admin Officer	_____	_____
Air Ops Officer	_____	_____
Briefing Officer	_____	
Debriefing	_____	
Local FRO	_____	_____

Object of Search

Details:

Results

Details:

Signed _____

CAP-MASF

"High Bird" Work Sheet

Date:

A/C #

SECTIONAL:

MSN PILOT:

GRID #

PILOT/OBS:

TOTAL HOBBS TIME:

MISSION #

CAP FLIGHT #

SORTIE #

INTERVAL FOR OPS NORMAL CALLS

MAIN FREQUENCY

GUARD FREQUENCY

AIRCRAFT CALLSIGN	N 3	INT 1	INT 2	INT 3	INT 4	INT 5	INT 6	INT 7	INT 8	INT 9	INT 10	INT 11	INT 12

NOTES:

Ground Teams

Callsign

Callsign

Alpha
Bravo
Charlie

Delta
Echo
Foxtrot

"High Bird" Transmission Log

Date ____ / ____ / ____

**D
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e
d**

[illegible]

Route Coordinates

Date: _____

Sectional: _____ Grid #: _____
Entry Point: N _____ W _____
Exit Point: N _____ W _____

[illegible]

NAVIGATIONAL AIDS

IDENTIFIER

FREQUENCY

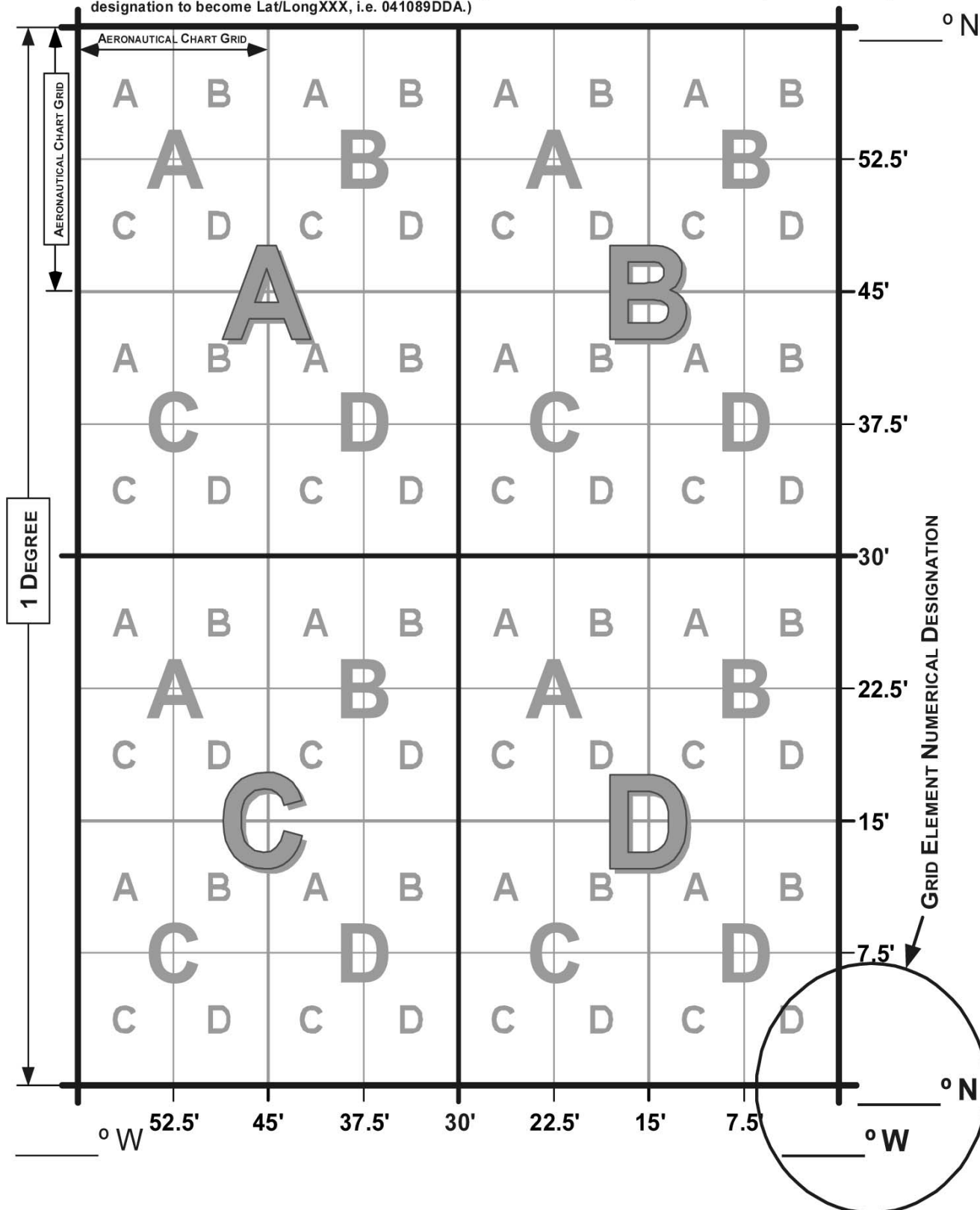
RADIAL

1.

2.

STANDARDIZED LATITUDE/LONGITUDE GRID SYSTEM

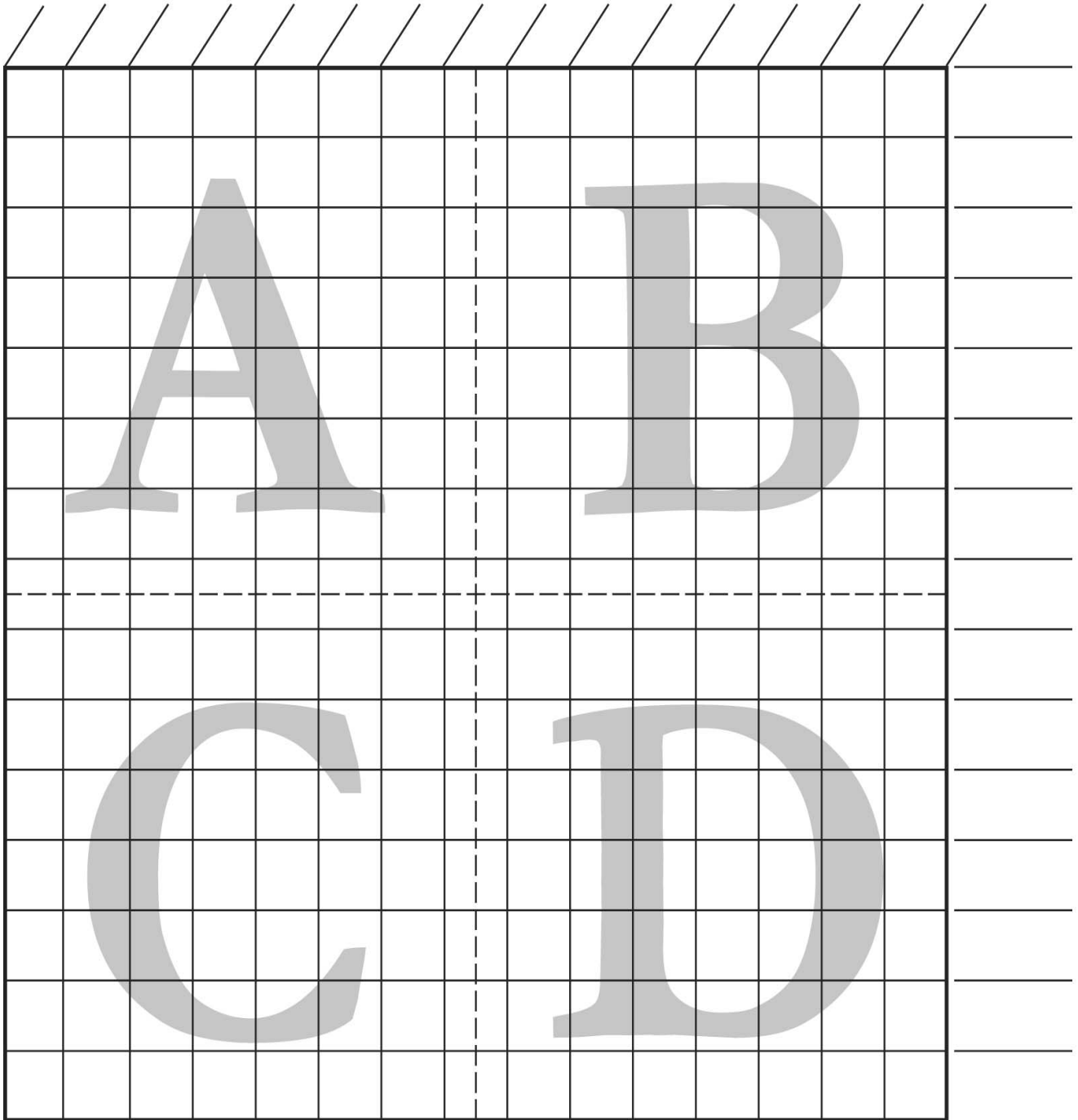
The basic element of this system is one full degree of latitude and longitude forming a square. The grid element is then designated numerically by the full degree coordinates in the lower right corner (southeast) of the grid. Example: Chicago Grid 385 is designated 40092AA; Grid 368 is designated 041089DD. The designation can be further identified by dividing the Aeronautical Chart numerical grid into 4ths creating additional ABCD quadrants allowing the designation to become Lat/LongXXX, i.e. 041089DDA.)



Grid Coordinates

Date: _____

Sectional: _____ Grid #: _____
Entry Point: N _____ W _____
Exit Point N _____ W _____



NAVIGATIONAL AIDS

IDENTIFIER

FREQUENCY

RADIAL

1.

2.

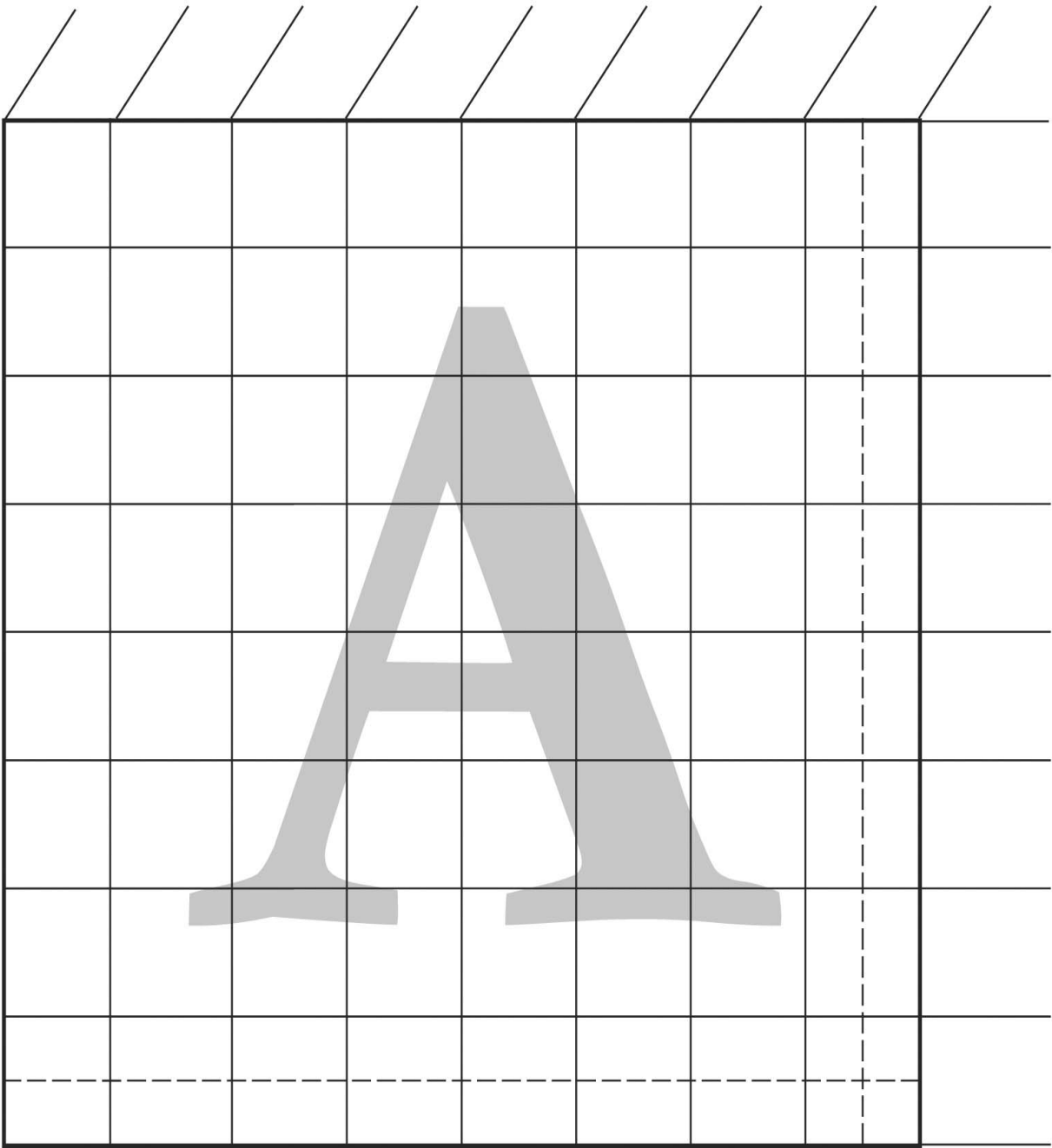
Quarter Grid Coordinates A

Date:_____

Sectional: _____ Grid #: _____

Entry Point: N _____ W _____

Exit Point N _____ W _____

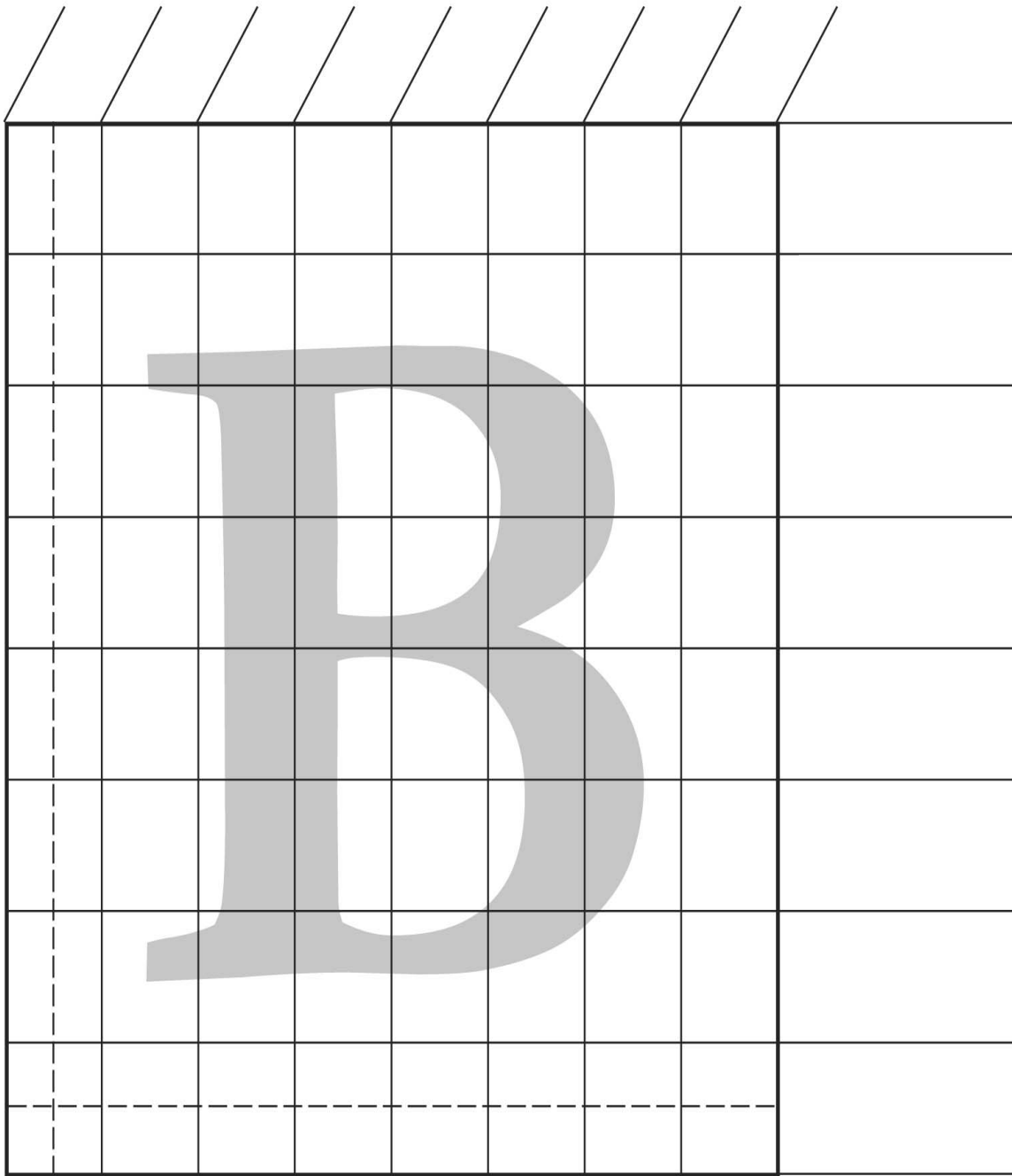


NAVIGATIONAL AIDS			
	IDENTIFIER	FREQUENCY	RADIAL
1.	_____	_____	_____
2.	_____	_____	_____

Quarter Grid Coordinates B

Date: _____

Sectional: _____ Grid #: _____
Entry Point: N _____ W _____
Exit Point N _____ W _____



NAVIGATIONAL AIDS

	IDENTIFIER	FREQUENCY	RADIAL
1.	_____	_____	_____
2.	_____	_____	_____

Quarter Grid Coordinates C

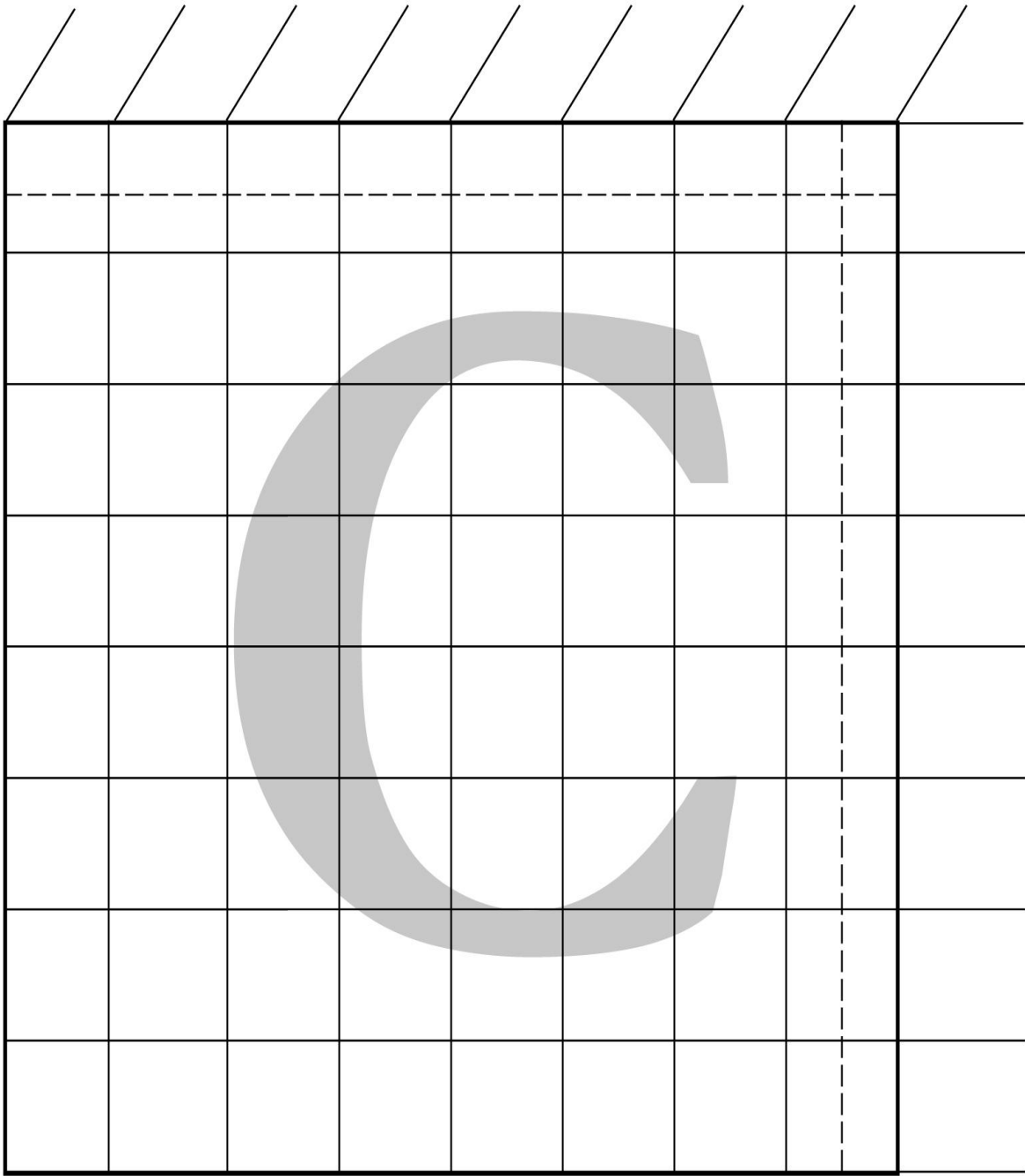
Date:_____

Sectional: _____

Grid #: _____

Entry Point: N _____ W _____

Exit Point N _____ W _____



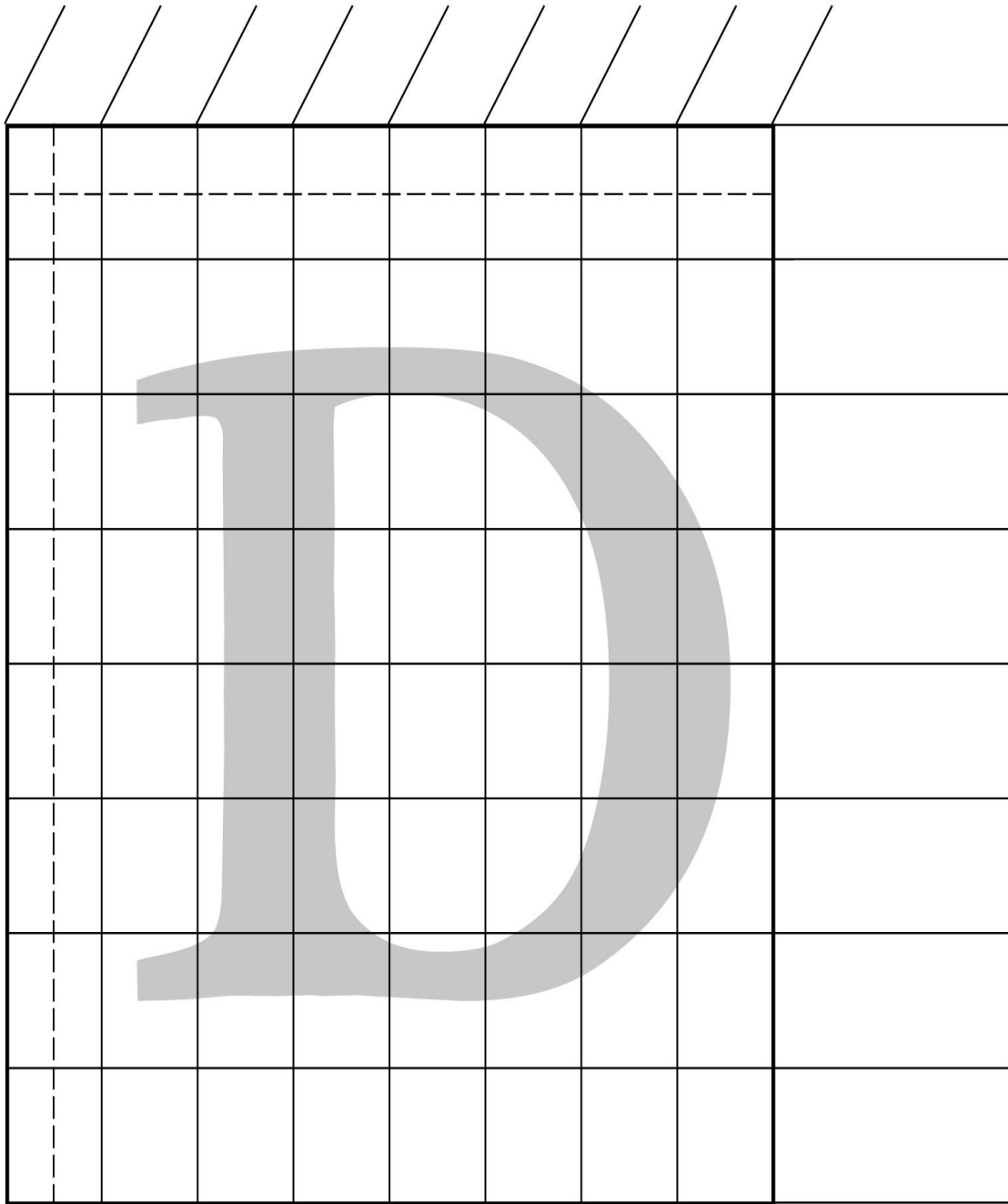
NAVIGATIONAL AIDS

	IDENTIFIER	FREQUENCY	RADIAL
1.	_____	_____	_____
2.	_____	_____	_____

Quarter Grid Coordinates D

Date:_____

Sectional: _____ Grid #: _____
Entry Point: N _____ W _____
Exit Point N _____ W _____



NAVIGATIONAL AIDS

IDENTIFIER

FREQUENCY

RADIAL

1. _____
2. _____

Creeping Line Coordinates

Date: _____

Sectional: _____ Grid #: _____
 Entry Point: N _____ W _____
 Exit Point N _____ W _____

[illegible]

NAVIGATIONAL AIDS

IDENTIFIER

FREQUENCY

RADIAL

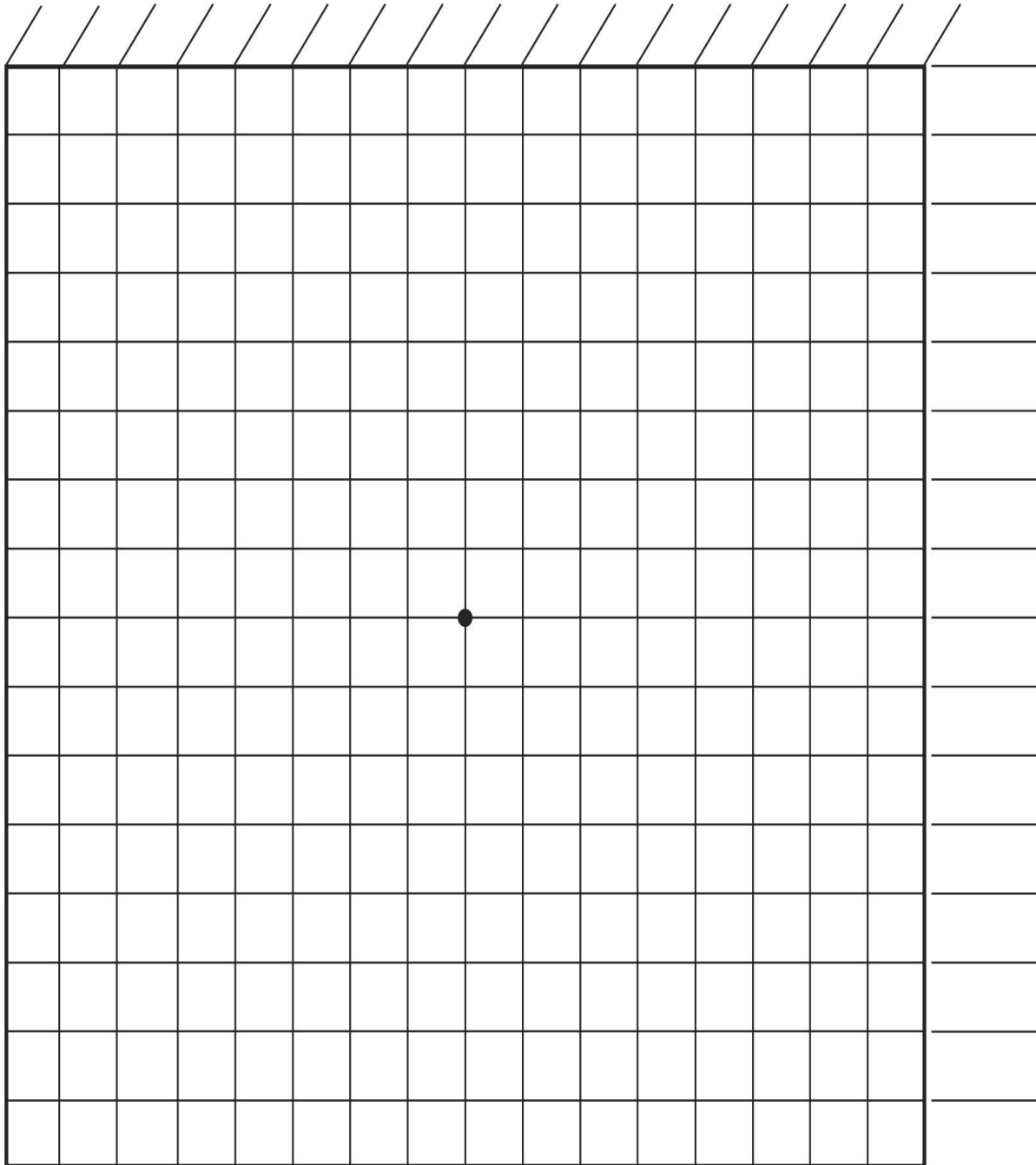
1.

2.

Expanding Square Coordinates

Date: _____

Sectional: _____ Grid #: _____
 Entry Point: N _____ W _____
 Exit Point N _____ W _____



NAVIGATIONAL AIDS

IDENTIFIER

FREQUENCY

RADIAL

1.

2.
